December 29, 1947

STEEL

The Magazine of Metalworking and Metalproducing

TECHNOLOGY DEPARTMENT ESTABLISHED 1882 EDITORIAL INDEX, PAGE 111

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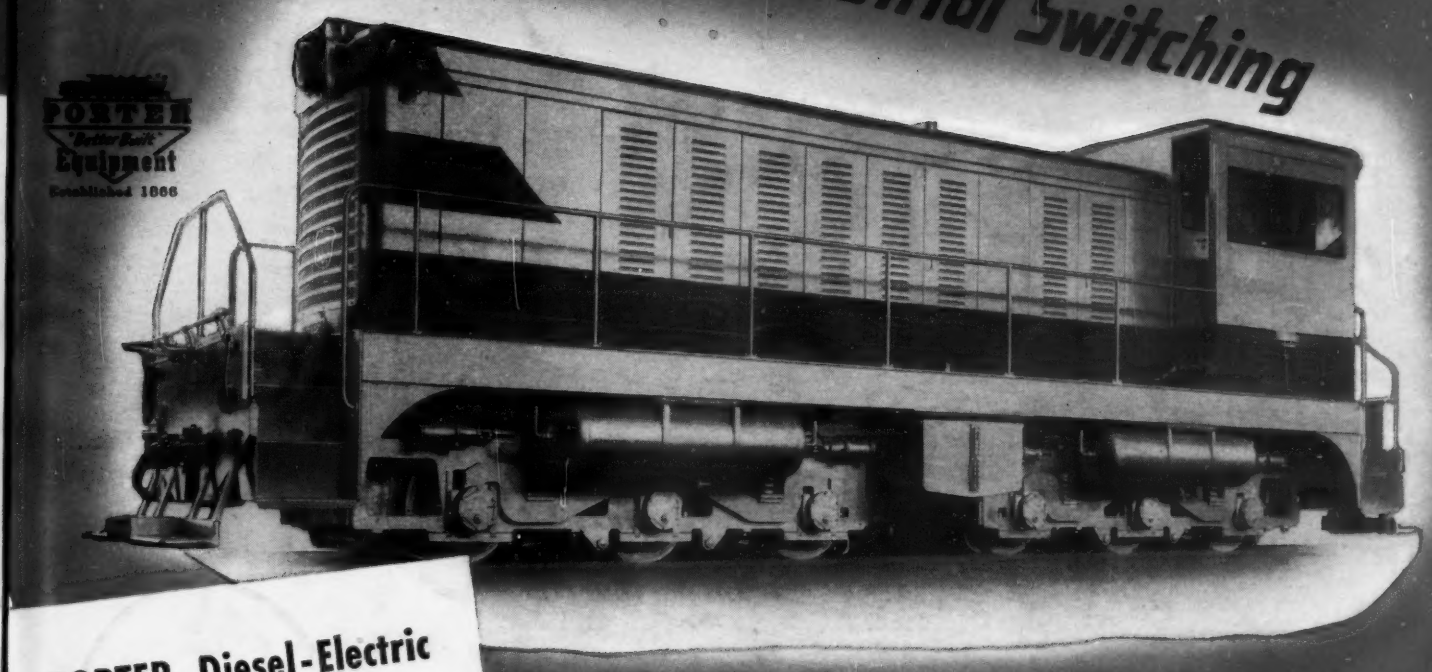
DETROIT

PORTER
Diesel-Electric
LOCOMOTIVES

NEW POWER for Industrial Switching



This 75-ton, 660 HP Single-Engine Diesel-Electric Switcher is the newest addition to the Porter line. Built for road or switching service in standard or narrow gauge.

PORTER Diesel-Electric Switchers are establishing amazing records for economy, reliability and high availability.

H. K. PORTER COMPANY, Inc.
PITTSBURGH 22, PENNSYLVANIA
District Offices in Principal Cities

Simplest on Market!

ALLIS-CHALMERS INDUCTION HEATERS

A SURVEY OF LEADING ELECTRONIC INDUCTION HEATERS shows that Allis-Chalmers units are the *most simple on the market!* They operate without *additional timers* or *extra gadgets.* Here's the reason . . .

Because A-C uses a *special* output circuit, work coils can be simply matched to the heater . . . there are no extra, expensive output transformers to buy and install! *(In fact, this is the only leading standard unit that does not require additional output transformers.)*

Installation of extra transformers requires specialized personnel; represents a high voltage hazard requiring shielding . . . another *additional, unnecessary* expense!

Yes, for the *simplest* way to higher production and better products through induction heat, contact ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2342

Production Increased 1000%!

THIS LUBRICATOR ASSEMBLY manufacturer was getting *only 20 units per hour* with an *experienced* brazer. Rejects were extremely high due to chemical reaction on cadmium plating. Now, with an Allis-Chalmers 20 kw induction heater, a completely *inexperienced* operator induction brazes *over 200 units per hour* with no rejects!

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products

Mayari R

Modern, 33-passenger, pusher-type transit bus built by United Truck Equipment Co., Motor Coach Division, Baltimore. 15 pct deadweight was saved through the use of Mayari R steel.

This 33-passenger transit bus is built of Mayari R low-alloy, high-tensile steel. It was designed to weigh approximately 15 pct less than a similar vehicle built of ordinary carbon steel.

The builders considered several materials. They found that Mayari R has a combination of mechanical properties that permit the high working stresses needed for light-weight construction. They studied its resistance to atmospheric corrosion, to abrasion, and to denting. They took into account its longer paint-life. Weighing all of these factors, they selected Mayari R as an economical, dependable material well suited for their use in the highly-competitive bus-building field.

Mayari R is versatile steel widely used by the automotive industry for bus, truck and trailer frames, body members, flooring, sides and impact bars. For more complete information on the properties, workability and applications of this steel, write for Catalog 209.

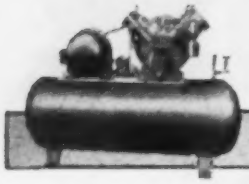
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

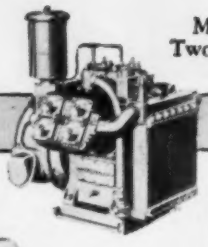
★ BETHLEHEM STEEL ★

Mayari R *makes it lighter... stronger... longer lasting*

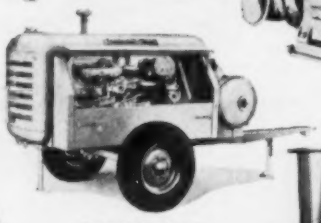
WHICH AIR POWER SYSTEM DO YOU NEED



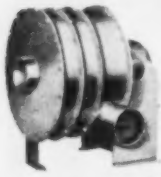
Type 30
Air-Cooled
½ to 15 hp



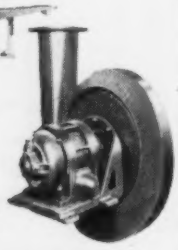
Motorcompressor
Two-stage Air-Cooled
25 to 90 hp



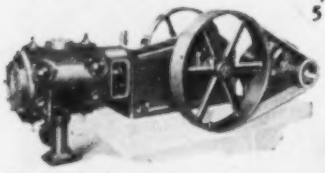
Type G Blower
½ to 2¼ psi
2 to 30 hp



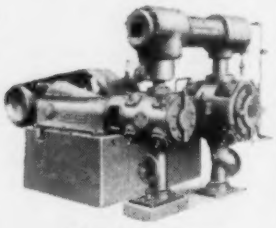
MOBIL-AIR
60 to 500 cfm



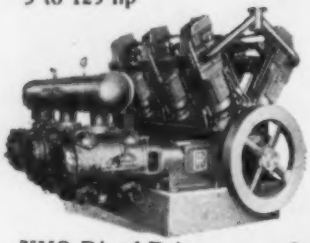
FS Blower
¾ to 3 psi
5 to 250 hp



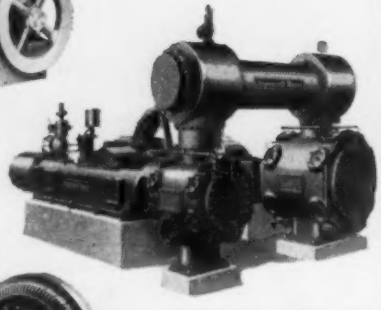
ES Single-Stage
5 to 125 hp



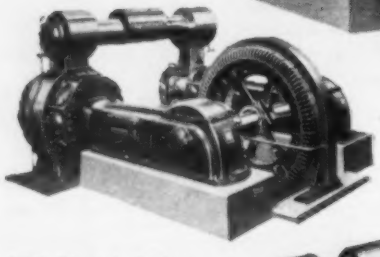
XCB Two-Stage
75 to 300 hp



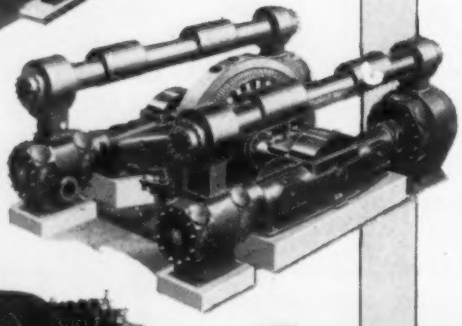
XVO Diesel-Driven
65 to 275 hp
(also 1200 hp
with gas drive)



XPV Steam-Driven
50 to 1500 hp

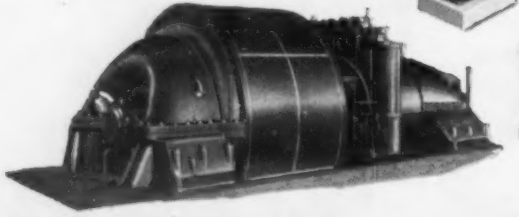


PRE Electric-Driven
300 to 1000 hp



PRE 4-Corner Type
1000 to 3000 hp

Turbo-Blower
up to 30,000 hp



☐ Centralized

☐ De Centralized

☐ Combined

LET I-R HELP YOU REACH YOUR DECISION

No matter which system you choose, you can select Ingersoll-Rand compressors to meet your requirements . . . from ½ to 30,000 hp . . . for any pressures or vacuums . . . air-cooled or water-cooled types . . . electric-motor, steam, gas, or diesel-engine drive . . . stationary or portable.

But first of all, choose *the system* that will give you Air Power where you need it, when you need it, and at the lowest possible over-all cost. What about your plant flexibility . . . floor space available at scattered locations where you *use* the Air Power as compared to space for a central plant . . . the availability and relative merits of electricity, steam, gas, or oil to drive the compressors . . . load factors and load cycles . . . attendance and maintenance?

These are just some of the questions you must run down before deciding upon a centralized, de-centralized, or a combination Compressed-Air System. These are the questions which the I-R Air-Power Specialist can help you answer.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 83-1

COMPRESSORS · AIR TOOLS · ROCK DRILLS · TURBO BLOWERS · CONDENSERS · CENTRIFUGAL PUMPS · OIL AND GAS ENGINES

The machine with electric ears

A typical example of B. F. Goodrich product development

ONCE in a long while, when tops are soldered onto evaporated milk cans, a drop of solder falls into the can and is sealed in. And once-in-a-while is too often for good canners.

So one of them developed this machine. It has a pair of moving rubber belts which seize each can between them. At one point the moving belts are jerked upward, shaking the can. If there is the smallest piece of solder inside, it "pings." An electric ear hears that ping, works an arm, and the offending can is thrown out.

But it was murder for rubber belts. They have to have enough "give" to stretch for the shaking action yet still hold the can snugly enough to move it along the line. And during the shake the belts must scuff over the can without wearing or tearing.

B. F. Goodrich had developed a belt made of strong cords each encased in thick rubber, so the cords can "give" yet quickly return to position. In addition, B. F. Goodrich had developed a means of making a belt endless, with no metal fasteners to catch or cut.

These B. F. Goodrich belts were tried on the machine and worked perfectly — they last longer, don't stretch out of shape, work more smoothly than other belts tried before.

Developments in rubber are taking place constantly at B. F. Goodrich. That's why it pays to check with your B. F. Goodrich distributor, to see what improvements BFG has made recently in the products you use. *The B. F. Goodrich Co., Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

FIRST IN RUBBER

Behind the Scenes...

E. L. S., Philosopher

We have, along with thousands of metalworking executives all over the country, been constant readers of our No. 1 feature, "As the Editor Views the News". We like to read Editor-in-Chief Shaner's comments on topics of the day, and we admire his carefully written prose. We weren't aware until just the other day, however, that he had reached the realm of philosophy. This was brought to our attention by one of those monthly mailing pieces which we receive from an advertising agency. It contains paragraphs which summarize important industrial articles from various publications, and in between these summaries are short lines from such sources as Elbert Hubbard, the Ancient Greek Philosophers, Chinese Proverbs, and such. Imagine, then, our interest and amazement to find in this month's collection the following: "Those who live above the law at first think it is clever. Next it is uncomfortable and finally it becomes unbearable."—E. L. Shaner.

Roumanian Request

We beg to report on a communique received from the Mathematical Institute of the Polytechnical High School, Jassy, Roumania. And we can say at the outset we're mighty happy we didn't have to attend such a high school, because the sort of stuff they expect their students to assimilate would founder many a college graduate. In particular, however, the letter asks us "the sending us whenever in view to be printed in our Bulletin the original articles of Mathematics, Fisics, Chemistry and Technics not yet published no where else in extenso (every author receives 50 extracts free of cost)." And then, after several paragraphs of similar requests for anything and everything scientific from microfilm to traveling professorships, they wind up like this: "It is quite superfluous to insist to write you that we shall be enraptured to dedicate you the realisations made in our institute with your favour and your kind help. Let us be the expounders of our anticipated gratitude".

Season's Greetings

Although this issue is slated to reach you readers a couple of days after Christmas, we're writing this long before Christmas and taking this opportunity to pass along our annual good wishes, and our hopes for a prosperous and interesting 1948. On that last part of the wish, we can hardly miss. Every presidential year is interesting, and this one promises to be considerably more so than any of the more recent ones. And since the oldsters were wont to say that a presidential year means good business, and in more cases than not they were right, we figure that it will probably be a most prosperous year for most of the metalworking industry. Seems like there's nothing in the wind which can keep us from breaking a few more production records all along the line, and it's hard to be particularly downhearted about such prospects.

Of Things To Come

Of course all is not so rosy as it might seem. There's still the steel shortage plaguing lots of plants, the ever increasing costs and prices, followed by wages, which in turn starts the spiral again. However, we're going to go way out on a limb and predict a few things for 1948, in advance of the annual predictions of the editors. Their predictions will come next week. This week we are unhampered (except for the fact that they're looking over our shoulder). We predict that 1948 will have twelve months, and that there will be snow, rain and sunshine. Every Monday will see a new issue of STEEL, and each issue will be full of interesting and important news about the industry. There will also be advertising pages in each issue, filled with money-saving or money-making ideas for metalworking plants, and thousands of you good people will read them, thus fulfilling their mission in life, and making both our advertisers and our advertising department very happy about the whole thing. And although we hate to admit it, you'll probably find this department in every issue, and very likely on this page, although we aren't making any promises. And since some of you readers have indicated a demand for further puzzles, we'll undoubtedly uncover a few new chestnuts for you, although we hereby solemnly promise never to have anything further to do with cows.

Shrdlu

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STEEL

Vol. 121—No. 26 December 29, 1947

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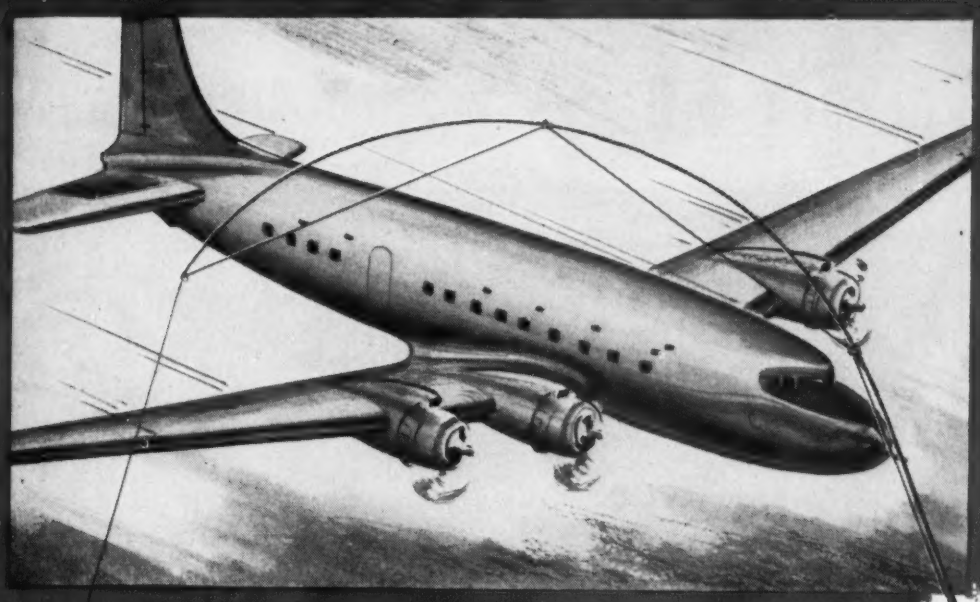
Editorial Staff on Contents Page



For anything that moves

SHARON ALLOY STEEL

Trout rods to transport planes—hard, tough, resilient Sharon Alloy Steel makes products lighter, stronger, more wear-resistant.... makes them less costly, too.

Because of special characteristics of strength and endurance.... because of high resistance to abrasion.... parts made of Sharon Alloy Steel—part for part—can be made *lighter.*

This means Sharon Alloy Steel gives *more parts per ton*.... more parts per ton means lower material costs, lower shipping costs of finished products.

If your problem is the choice of a proper alloy steel or its method of fabrication, consult Sharon's staff of experienced metallurgists. Write or call the nearest Sharon field office *today.*

SHARON STEEL CORPORATION
Dept. S.
Sharon, Pennsylvania

SHARONSTEEL

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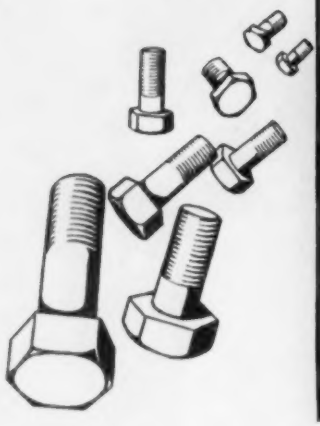
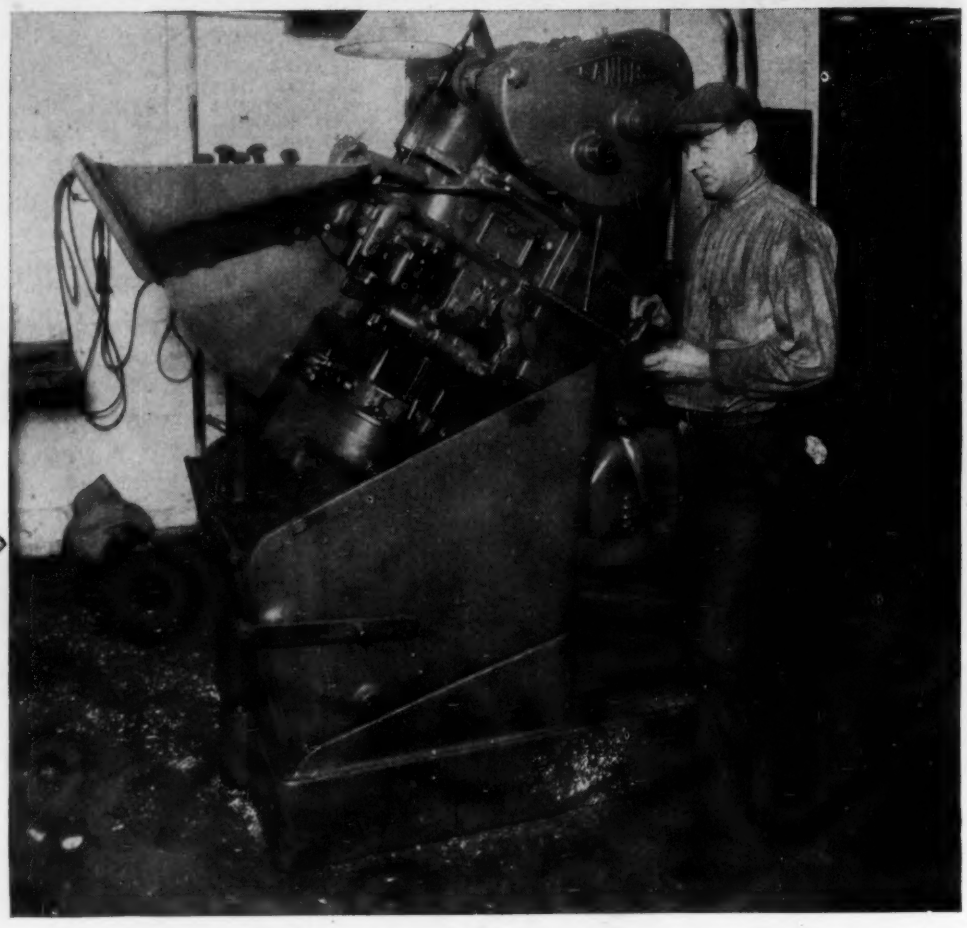
Productive

Accurate

Economical





And Averages 10,000 Threads per Chaser Grind

LANDIS AUTOMATIC FORMING AND THREADING MACHINE

Write for Bulletin E-70

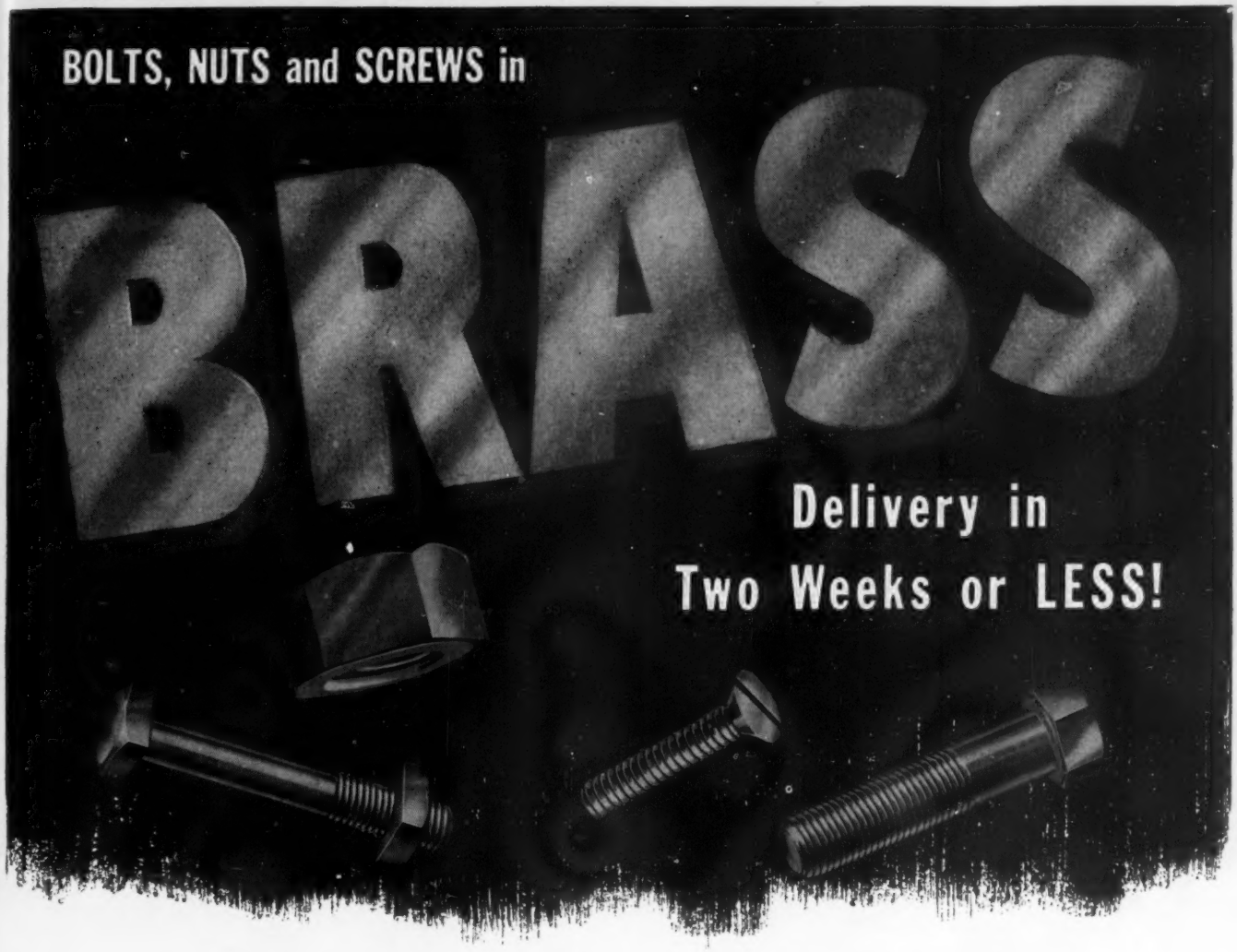
LANDIS
REG. U.S. TRADE-MARK PAT. OFF.

LANDIS MACHINE CO.
WAYNESBORO, PA., U.S.A.

BOLTS, NUTS and SCREWS in

BRASS

Delivery in
Two Weeks or LESS!



We are now offering numerous types and sizes of brass fasteners for immediate delivery, including: Machine bolts, cap screws and machine screws in all head styles plus hex nuts and special fastenings. Items not available from inventory, in production run quantities, can be supplied in two weeks from entry of order.

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SEND FOR YOUR FREE FASTENING BUYER'S GUIDE

Sterling's new catalog is crammed cover-to-cover with technical information, engineering data and list prices covering virtually every one of the 200,000 metal fastening items used in every industrial field.

- THUMB INDEXED — EASY TO USE
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- IT'S FREE!

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Please send me, without obligation, a copy of your new, easy-to-use catalog. (Please print).

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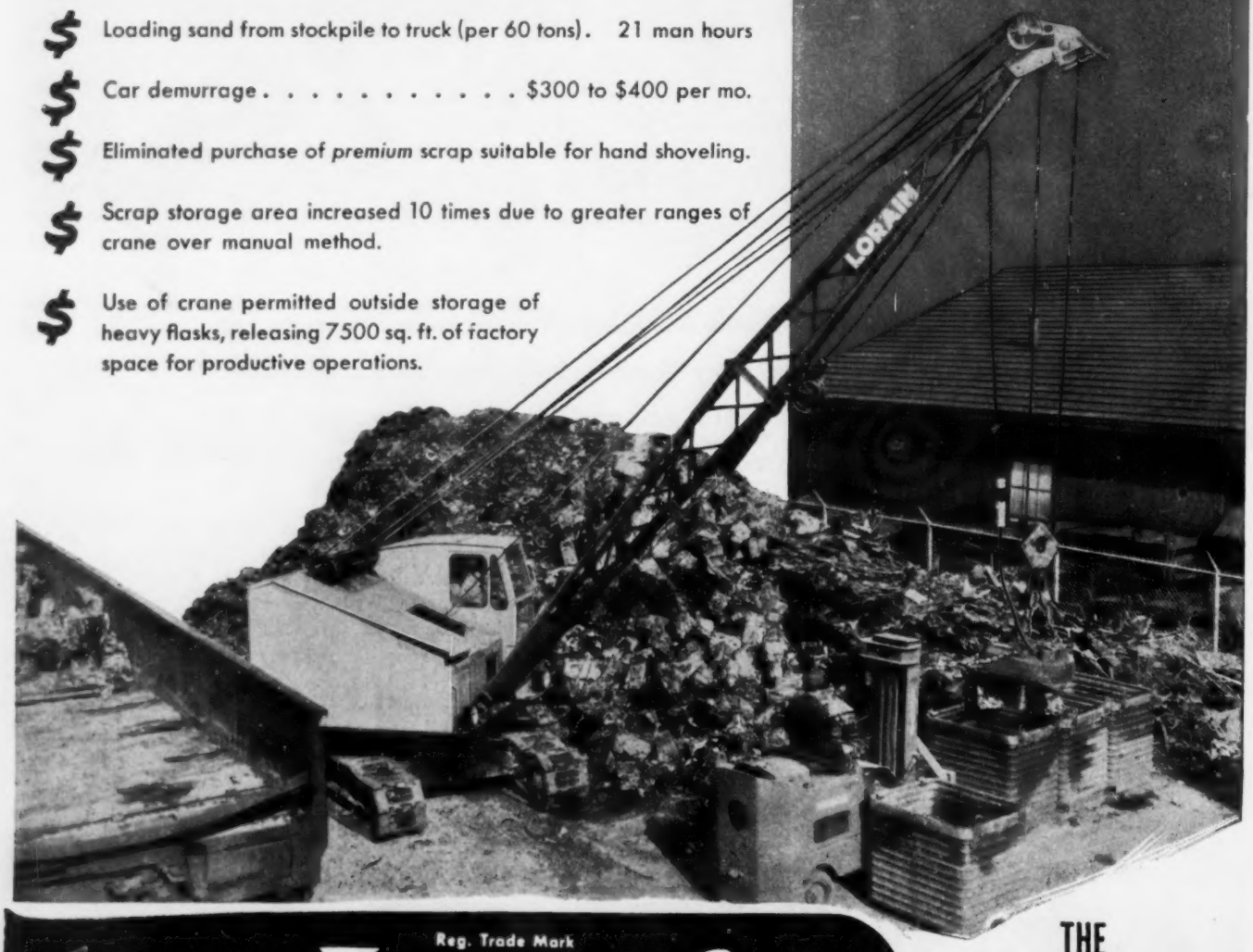
LORAIN CUTS COSTS

8 ways...

A well-known Northern Ohio foundry recently installed its first crane —a Lorain TL-20. The results were quick, startling and positive. Check these savings of crane-handling materials over man-handling methods—then look out the window at your yard and see what you can save.

Labor-saving, cost-cutting Lorain cranes are available as 2-speed crawler units or with rubber-tire mountings (self-propelled or two-engine types). Your local Thew-Lorain distributor can supply complete information. Call him today.

	OPERATION	SAVINGS
$	Unloading scrap from cars to stockpile (per car) .	36 man hours
$	Loading scrap from stockpile to charging boxes (per day)	13 man hours
$	Unloading sand from cars to stockpile (per car) .	28 man hours
$	Loading sand from stockpile to truck (per 60 tons).	21 man hours
$	Car demurrage	$300 to $400 per mo.
$	Eliminated purchase of *premium* scrap suitable for hand shoveling.	
$	Scrap storage area increased 10 times due to greater ranges of crane over manual method.	
$	Use of crane permitted outside storage of heavy flasks, releasing 7500 sq. ft. of factory space for productive operations.	



Reg. Trade Mark

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THE THEW SHOVEL COMPANY
LORAIN, OHIO

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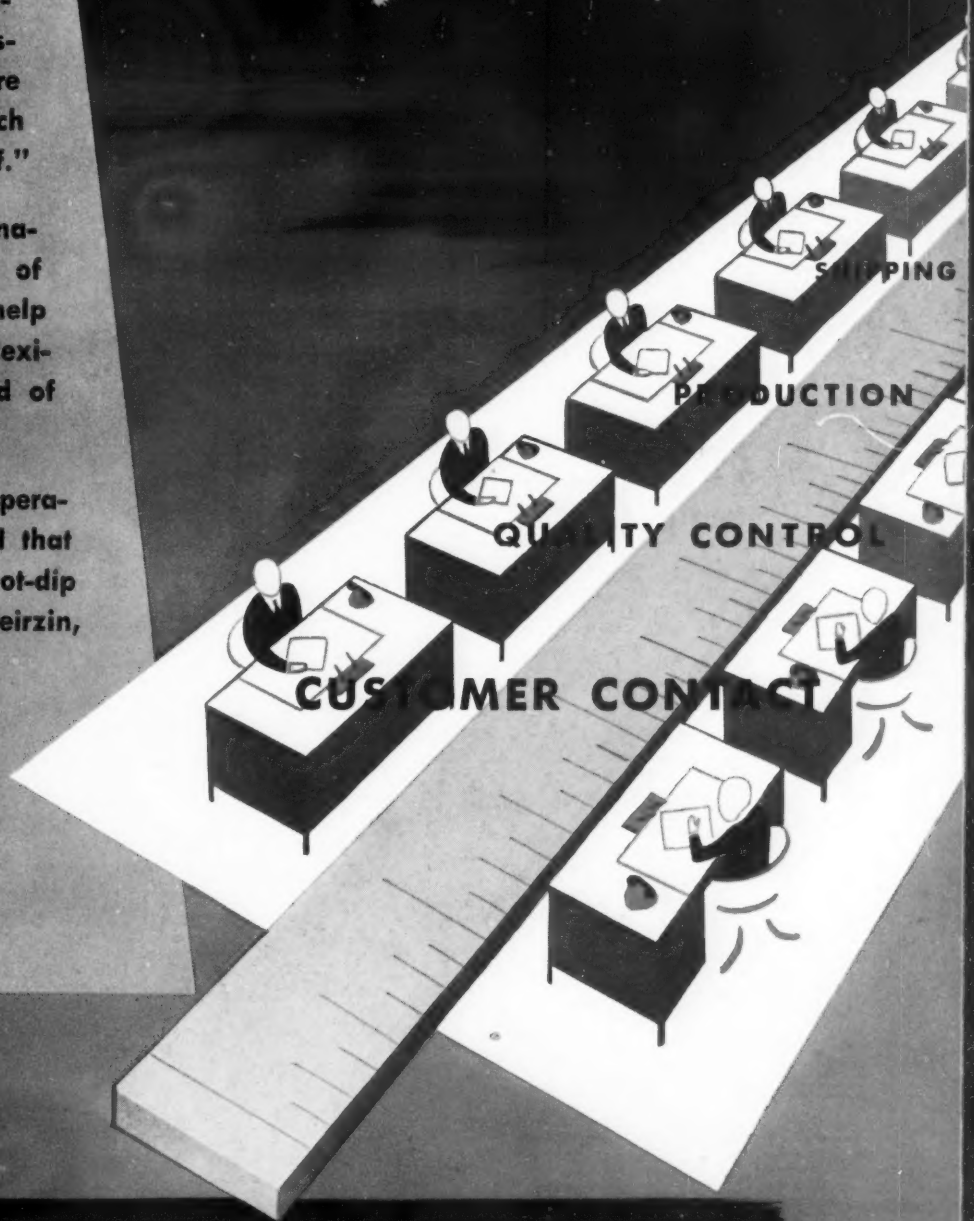
ONLY A MATTER OF FEET separates the Weirton specialists who bring their diverse talents to bear upon your steel problems. Metallurgists, production men, salesmen, shipping supervisors are all gathered within easy reach of one another "under one roof."

This centralization and coordination characterize all phases of Weirton's operations. And help to account for the unusual flexibility, versatility and speed of Weirton service.

The benefits of integrated operation extend to every steel that Weirton makes: Weirite hot-dip and electrolytic tin plate, Weirzin, Weircoloy, Weiralead, hot and cold rolled strip, cold rolled spring steel, cold rolled sheets, manufacturing and long ternes, structurals, N-A-X High-Tensile.



WEIRTON STEEL CO.

WEIRTON, W. VA. *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION**

Executive Offices, Pittsburgh, Pa.

HERE'S WHY...

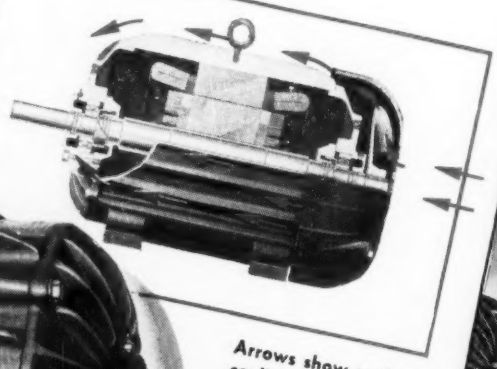
so many *Sealedpower* motors are being built today

More and more purchasers are specifying the Crocker-Wheeler Sealedpower Motor because they know it continues to operate year after year without "time out" for either cleaning or repairs. They know this motor doesn't have to be taken apart and cleaned periodically.

Crocker-Wheeler Engineers developed the Sealedpower Motor to permit continuous operation without shut-downs for the removal of dust and dirt from easily-clogged, hard-to-clean, double-walled passages found in conventional fan-cooled motors. The ventilating air that cools the Sealedpower Motor is always blown *outside* the frame, directed by heat radiating fins designed to properly guide and distribute the cooling air.

The vital operating parts are completely cut off from outside air. They run in a pocket of clean air, sealed in a frame of cast iron, immune to abrasive dust, corrosive fumes and excessive moisture.

The complete story of this exclusive Crocker-Wheeler design . . . the Sealedpower Motor . . . is contained in bulletin SL-300-2. Ask for your copy today. See what this motor will do for you.



Arrows show path of cooling air over exterior of frame.

CROCKER WHEELER

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Yearbook of Industry Issue

Metalworking Industry's 1947 Record and Prospects for 1948

STEEL's Annual Forum on Technical Progress in Metalworking

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 121, NO. 26 DECEMBER 29, 1947

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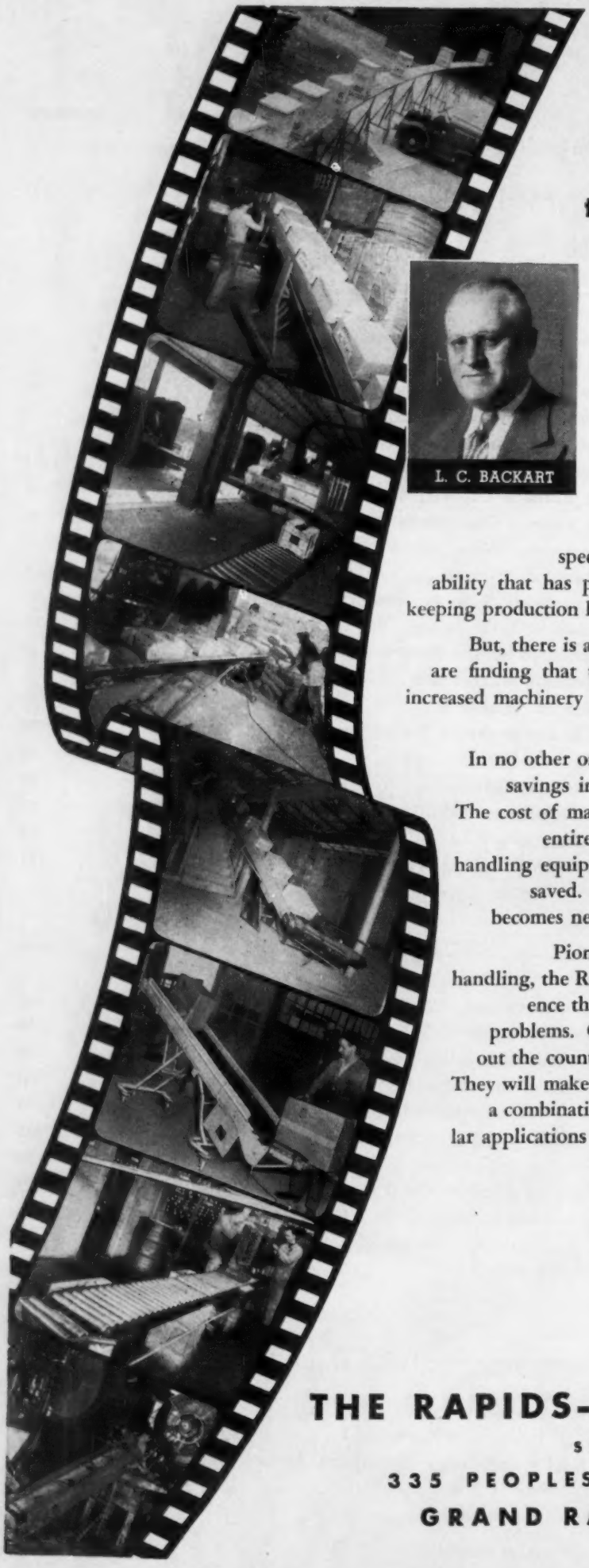

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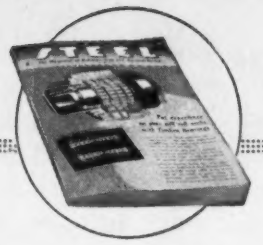

December 29, 1947

Paradoxical 1947

As the end of 1947 approaches, most persons will be inclined to write it off as a disappointing year in most respects. Certainly few years in modern history have matched 1947 in the number of important frustrations.

In international affairs matters are about as bad as could be imagined—short of a shooting war. When one's mind wanders over one trouble spot to another around the globe, one almost despairs of enduring peace in our time. Yet in spite of the seriousness of world antagonism so apparent everywhere, there has been some cause for encouragement in the developments of the past year. For one thing, the lines of conflict have become more clearly defined. We know much better today where we stand and what dangers confront us than we did at the beginning of 1947. Secondly, there are indications that the democratic way of life is beginning to make some gain against the totalitarian concept.

In our own nation the situation is complicated by an odd array of paradoxes. On the whole, the administration of our government has been poor. The combination of an executive branch under one party and of a legislative branch under the opposing party—always a difficult proposition—has seemed to be unusually ineffective. Good intentions on both sides have been frustrated by poor politics. There has been a noticeable reluctance to come to grips with important national problems.

In sharp contrast to the ineptitude of the national government has been the performance of the nation's workshops. Industrial production in 1947 in most lines established new peacetime peaks. This was due not only to the absence of crippling strikes which ruined the record of 1946, but also to the ability of industry to overcome exceptional problems of materials supply, equipment and services. The high rate of industrial production maintained during the past few weeks of the year demonstrates quite clearly the great potential of American industry when it has even a poor chance to show what it can do.

Great as was the production record of 1947, we should remember that part of it was achieved by bribing coal miners to stay on the job. The problems of appeasement and inflation still confront us.

* * *

CONSTRUCTIVE MEETING: It will be recalled that the contract between the steel producing subsidiaries of the U. S. Steel Corp. and the United Steelworkers of America (CIO) provides that quarterly meetings be held for the purpose of developing friendly and co-operative relationships between the company and the union, and among all employees at all levels.

At the time this provision was announced there was some natural skepticism as to whether this high purpose could be achieved in view of the deep rooted misunderstanding and antagonism which has grown up in recent years. While the final answer probably has not been demonstrated, there are indications—based on the quarterly meeting which began Dec. 12—that these conferences may prove to be exceedingly valuable.

The vice president, engineering, of U. S. Steel of Delaware outlined the $500 million modernization and expansion program of the subsidiaries. Five vice presidents of subsidiaries described projects undertaken by their respective companies. Another official presented a review

(OVER)

of progress in safety in plants during the first nine months of 1947.

One can assume that as these plans for modernization and expansion were explained in detail by responsible company officials, many union members in the audience realized that the information they were receiving completely refuted the absurd charges made by some union spokesmen to the effect that steel producers are trying to maintain high prices and scarcities by refusing to expand and modernize.

It will be interesting to see whether or not the imparting of information at meetings of this kind will prompt leaders, such as Philip Murray, to caution union spokesmen to tone down their anti-business utterances. —p. 24

* * *

TEST OF CO-OPERATION: An interesting test of the practicability of the theory that inflation can be curbed better by voluntary co-operation of industry than by government control requested by President Truman is being applied to the nail industry.

Representatives of most nail manufacturers met with Senator Ralph E. Flanders to see what could be done to wipe out the gray market in nails and to improve the supply of nails. The nailmakers adopted a 5-point program, based entirely on voluntary action of the industry, which aims at improving the nail situation at an early date.

Senator Flanders' sub-committee had uncovered convincing evidence of a widespread gray market in nails. Much of the evidence deals with persons and companies not normally identified with the production or distribution of nails.

It is fortunate that this test of voluntary co-operation is being conducted by Senator Flanders. He is an industrialist and has a sound grasp of economics. We have high hopes that this test will prove that voluntary co-operation can be effective and satisfactory. —p. 18

* * *

RECORD-BREAKING YEAR: Nineteen-forty-seven is coming to a close with new records for peacetime being chalked up in the iron and steel industry. In the face of seriously deficient metallics supply, chiefly scrap, the industry during the year turned out an estimated 84,700,000 tons of steel ingots, equivalent to more than 62 million tons of finished steel.

It is significant that every major peacetime steel consuming outlet received larger tonnages of steel in 1947 than they did in 1940, the last prewar year. In the steel production record for 1947 is to be found promise of better supply conditions in 1948 with new producing facilities scheduled to come into operation, and signs increasing that supply is beginning to catch up with demand in some directions. —p. 20.

* * *

NEW PIG IRON CAPACITY: Plaguing the metalworking industries ever since the war has been a shortage of metallics, both scrap and pig iron. Foundries have been forced to part-time operations due to inability to obtain sufficient iron. Steel production this year will be about 7 million tons short of capacity, due chiefly to the metallics shortage. This loss of production accounts largely for the acute shortage of steel products which is adversely affecting practically all manufacturers of ferrous products.

Announcement that 1.5 million tons of blast furnace capacity have been added in the past 12 months and that another 1.5 million tons are under construction comes as welcome news. The total blast furnace capacity, including ferroalloys, on Jan. 1 will be 67,202,390 tons.

Given some improvement in the supply of good quality coal and coke, some increase in pig iron production should be forthcoming.

—pp. 22, 23

* * *

COMPONENTS RESEARCH: The essential role of machine components in modern industry attaches especial signficance to any development in the field having a bearing on production.

During 1947 components manufacturers began to whittle away the large order backlogs which they had accumulated.

In view of this it is heartening to learn components manufacturers will go ahead with their plans for modernizing and improving their laboratories and operational facilities, determined to replace makeshift, war-engendered or otherwise inadequate quarters. The fact that more money is being spent by these manufacturers for research and development provides convincing evidence of faith in the future of the components industry and the nation. It gives the lie to statements that the American system of private enterprise views the future timidly and with foreboding. —p. 30

Happy New Year!

E. L. Shaner

EDITOR-IN-CHIEF

STEEL...

Backbone of Industry

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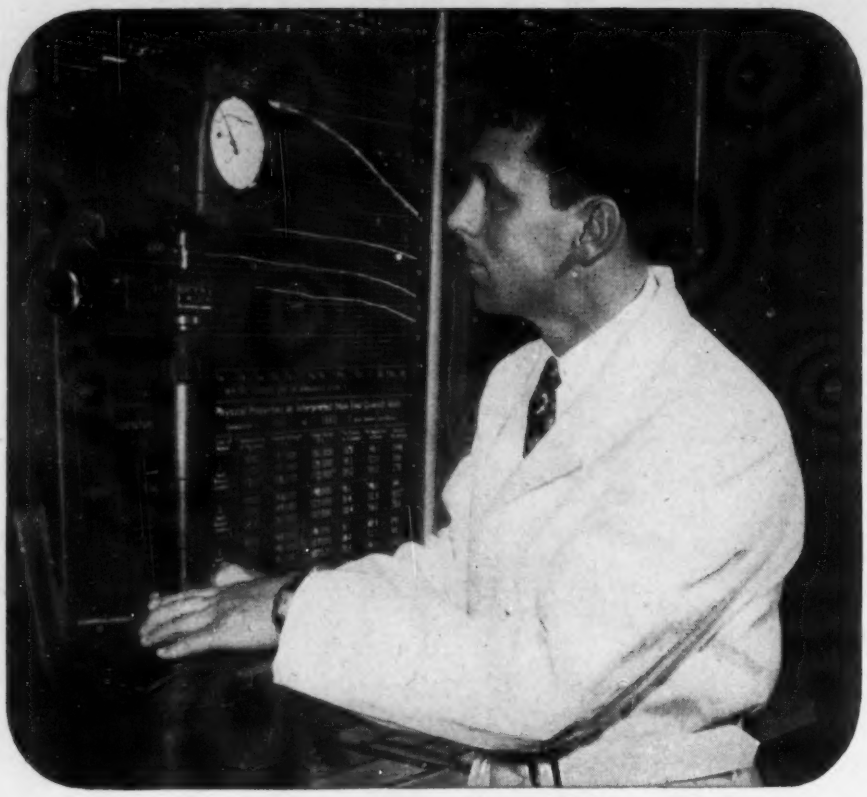

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RYERSON STEEL

News Summary

MORE STEEL IN 1948—A remarkable production record of around 84.7 million tons of steel was established in 1947 in the face of acute shortages of essential raw materials. Prospects for 1948 (p. 20) are for equal or greater output, assuming freedom from work stoppages. This, says an industry spokesman, should bring supply and demand close to a balance during the year.

VOLUNTARY ALLOCATIONS—Channeling of scarce steel products into the more essential uses through industry-government co-operation will be given a trial early next month. Department of Commerce (p. 19) has invited 15 leading steelmakers to a conference Jan. 8 and other industry representatives with experience on the old War Production Board and the Civilian Production Administration have been urged to return to Washington to help work out the mechanics of the voluntary allocation program. Should the program succeed in steel, it will be extended to other products.

GRAY MARKET—The same idea of industry-government co-operation is being used in an attempt to correct the gray market in nails. Nailmakers (p. 18) met with Sen. Ralph Flanders, himself a former industrialist, agreed to a five-point program for more equitable distribution of nails and the elimination of price premiums. Under consideration is a proposal for raising mill prices of nails to encourage greater production.

MACHINE COMPONENTS—The season is now open for 1948 industrial forecasts. Leading makers of machine components believe (p. 30) next year's production will be about on par with that of 1947, prices may rise slightly, deliveries will improve, and demand will continue at a satisfactory level. More money and time will be devoted by these manufacturers to research; in some cases, such expenditures have tripled since 1939.

LABOR RELATIONS—The quarterly meetings of officials of United States Steel Corp. subsidiaries and United Steelworkers, instituted in last spring's labor contract, are being watched by other companies with interest. Purpose of the meetings is to develop friendly and co-operative relationships between the company and all employees. Bargaining is taboo. At the most recent session (p. 24), corporation officials explained U. S. Steel's expansion program, told of technical improvements under way, and presented safety statistics for the subsidiaries.

PIG IRON—Blast furnace capacity at the beginning of 1948 will be 1.5 million tons greater (p.22) than at the start of 1947. Furnaces under construction will add another 1.5 million tons. Total capacity is now computed at 66,209,790 tons (p. 23).

EXPORTS—United States foreign trade turned upward in October (p. 25) after dropping to the year's low in September. Ferrous exports for the first nine months totaled 4,901,708 net tons. With most iron and steel products now coming under export control, foreign shipments of scarce commodities will be under constant review (p. 26). Public and congressional pressure is threatening to force a curtailment in shipments to Russia. Reports that Italy has been allocated large tonnages of pig iron are denied.

SIGNS OF THE TIMES—Industrial activity in the pre-Christmas week moved to a new postwar high, with STEEL's index (p. 38) reaching 172 per cent of the 1936-39 average . . . Truck exports in 1947 are estimated at 260,000 units, 21 per cent of total production (p. 33) . . . Special motor vehicle taxes collected in 1947 totaled nearly $3 billion, about $6000 a minute (p. 34) . . . . . President Truman has appointed (p. 24) a national labor-management panel to work with the Federal Mediation & Conciliation Service as stipulated in the Taft-Hartley Act . . . . . Communist-inspired strikes have set France back two months (p. 29) in its production timetable.

Co-operative Gray Market Cure Sought

Nailmakers meet with Senate committee to discuss correction of irregular practices. Raising of mill prices to encourage greater production under consideration

FIRST test of the practicability of the theory that inflation can be fought by voluntary co-operation of industry better than by the government controls demanded by President Truman has been applied to a segment of the steel industry. Specifically, it is being tried out on wire nails.

Sen. Ralph E. Flanders (Rep., Vt.) called the nail industry to Washington Dec. 17 and at a round-table meeting in the Senate caucus room told them that his subcommittee of the Joint Congressional Committee on Housing had unearthed incontrovertible evidence of a widespread gray market in nails. While the meeting was held behind closed doors, Senator Flanders told newsmen later that he was satisfied with the assurances he had received.

Makes Four Proposals—"The subcommittee made four proposals to help cure the critical gray market situation and the group, which represented practically the entire nail producing capacity of the country, agreed to try to see what could be done," he said. "They raised no objections. The general tenor of their views was that government controls were unnecessary. I told them when we opened the meeting that I wasn't going to threaten them, but that the subcommittee was going to follow up on how things turned out with this voluntary program."

Senator Flanders' attitude was considered specially significant in that he previously had gone on record as saying that there would be "widespread support for government controls in case the gray market was not cleared up by voluntary self-policing by the industry."

Their Program — The nailmakers' agreement with Senator Flanders falls into this 5-point program:

1—They agree to exercise all precautions to keep nails from reaching the gray market, and specifically to cut off shipments to customers found to be reselling in the gray market.

2—They agreed to ship more nails into areas of acute scarcity, particularly the Atlantic Coast region east of the Alleghenies, the entire Gulf Coast region, the Pacific Coast area and several small areas like the state of South Dakota.

3—They agreed to try to make good on their recent pledge to Sen. Joseph R. McCarthy (Rep., Wis.) to seek to increase nail production by 12 per cent next year. In this portion of the discussion it was disclosed that many of the nailmakers, particularly the nonintegrated interests, are having trouble getting material, and cannot make binding promises to increase production. It was pointed out that the completion of more nail capacity by the American Steel & Wire Co. next year should help the overall supply situation.

4—Integrated steel makers agreed to try to ship more rods to nonintegrated nail makers.

5—It was suggested that the industry, in the interest of greater production, cut down on the number of nail sizes. At present some 125 types and sizes of nails are being made, and representatives of the industry thought this could be cut down to 60 without causing hardship to users.

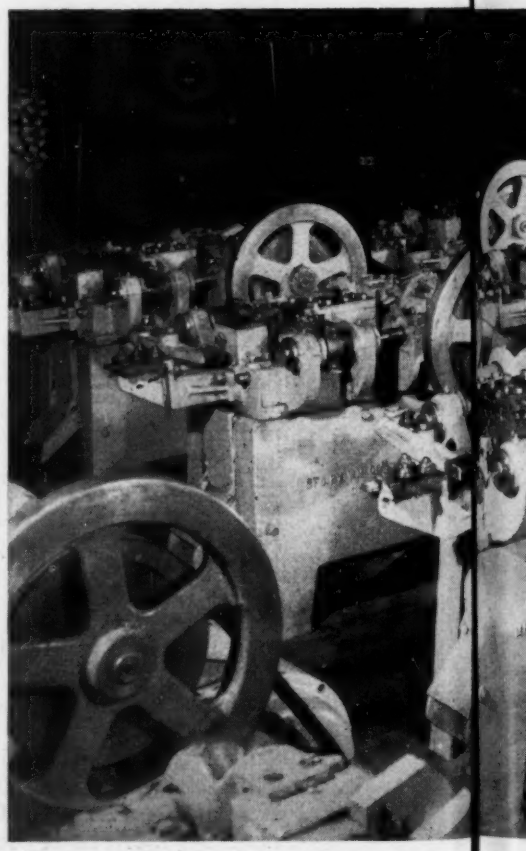
Raising Mill Prices Suggested—The meeting apparently brought out no formal discussion of the important angle of the mill price on nails; this, it was pointed out, was not permissible in view of failure up to that time in getting congressional approval of the proposal to exempt from prosecution under the antitrust laws companies in those industries that will co-operate in the voluntary anti-inflation program.

However, when some of the mills said that present prices are too low to encourage nail production—$4.55 base Worcester and $4.35 base Cleveland—the general attitude favored the quoting of prices that would tend to prevent undue diversion of billets to other finished steel products. Following the meeting there was some expectation that mills may up their prices shortly by a moderate amount —possibly by 75 cents or $1 per 100-pound keg. The feeling generally was that a moderate advance in mill prices that would wipe out the gray market would be beneficial to nail consumers in the end.

Senator Flanders said he was convinced that curtailed production was the real cause of the gray market. He has learned from the American Iron & Steel Institute, he said, that whereas annual nail capacity is 1,266,870 net tons, the production in 1947 has been at a rate of approximately 840,000 tons—or 66 per cent.

During the first nine months of 1947, nail and staple shipments totaled 606,557 tons, compared with 636,632 tons in all of 1946. Three fourths of all nails and staples are distributed through warehouses and nail distributors.

Gray Market Prices High—The nail men were given a lot of information that had been unearthed by the subcommittee. For example, out of 27 nail distributors in Washington only two were selling nails, one limiting individual sales to three pounds and the other to 10 pounds. Instances where builders gladly had paid outrageous prices in the gray market rather than incur a shutdown in their building operations were re-



vealed. Prices paid on gray market nails, it was disclosed, range up to as high as $22 a keg. Even the regular distributors were shown to be charging unduly high premiums;

(*Please turn to Page* 109)

Planning Voluntary Allocation Program

FIRST attempt at voluntary allocations through industry-government co-operation, as provided in the Taft anti-inflation bill passed by Congress in the closing hours of the special session, will be made Jan. 8 when 15 iron and steel producers confer with government officials in Washington.

Commerce Department experts last week were working on plans to present to the steelmakers, including proposals to increase production and keep steel from such nonessential users as tin cans for other than food packaging, license plates and certain types of amusement construction.

Representative steel companies had indicated their willingness to work with the government on a program of voluntary channeling of steel products to programs most essential to the economy.

Provides Antitrust Exemption—The stop-gap anti-inflation bill passed at the special session provided for amendment of antitrust laws to permit allocation of scarce materials by co-operative industry action, where such programs were approved by the President. The bill also provided for extension of export and transportation controls until Feb. 28, 1949. Other major issues in the anti-inflation program—credit restrictions, compulsory allocations, rationing and price and wage controls—were held over to the January session.

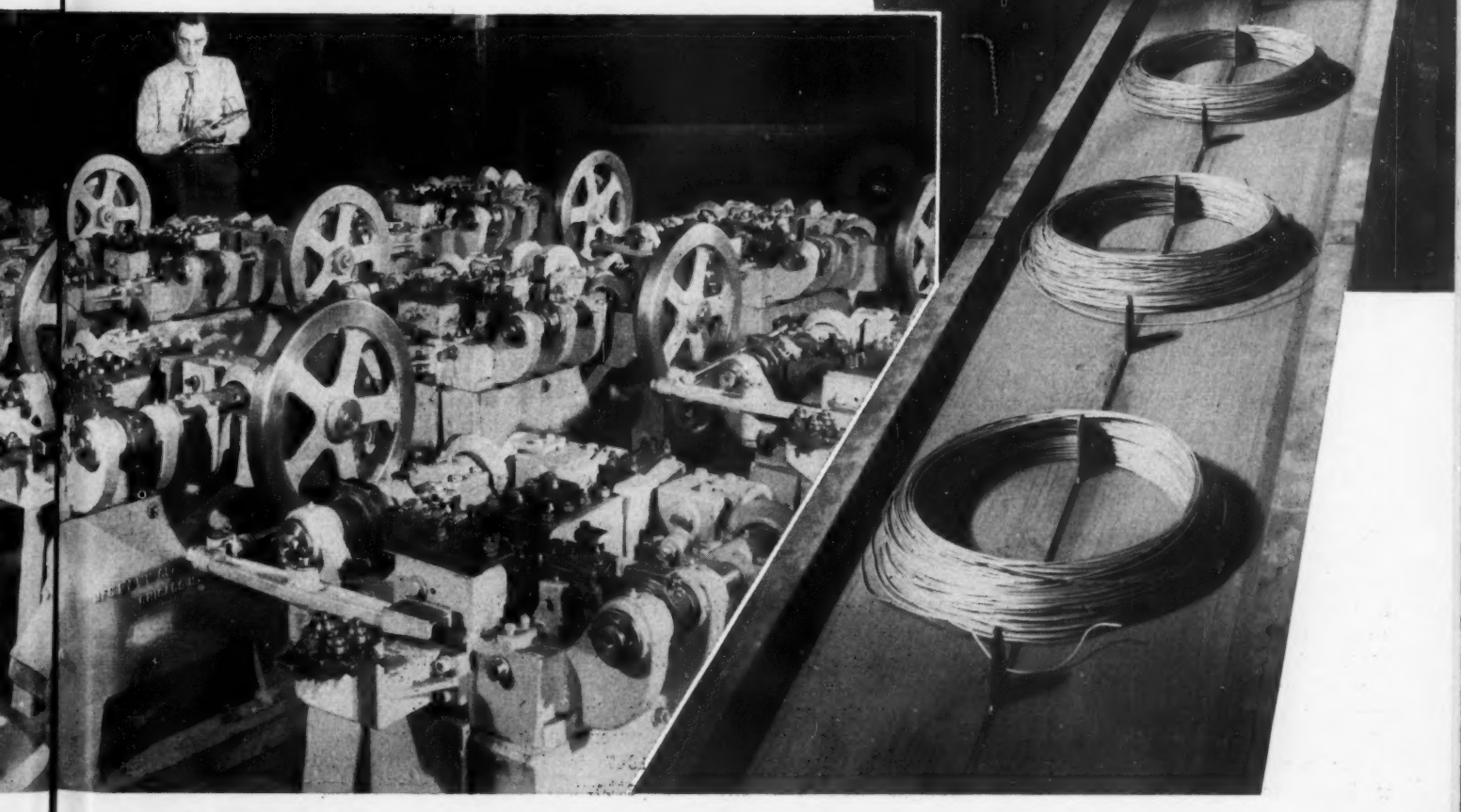
May Set Pace—The January conference of steel men and government officials may set the pace for the entire program of voluntary allocations. The Commerce Department has moved to revive much of the industry organization of the old WPB and the CPA. Fifteen industry figures have been urged to report for work at the Commerce Department the first week of January.

Iron and steel have been given priority in the program, but other materials, including nonferrous metals, farm machinery, electrical machinery, and building materials, are expected to follow.

The Commerce Department hopes to keep all agreements at the production level and not extend into the distribution and retail fields.

Faster nail making machines being installed, below, in the Joliet, Ill., works of American Steel & Wire Co. are expected to ease the acute shortage of nails now plaguing construction and other consuming industries

At right, a chain conveyor carries rod coils at Bethlehem Steel Co.'s new 10-in. rod mill at Sparrows Point, Md.



Tower Sees More Steel in 1948

Balance between supply and demand to be approached during year, provided output is not interrupted by strikes or material shortages. Peacetime record set in 1947

STEEL production in 1948 should equal or exceed the more than 84 million tons produced in 1947, assuming freedom from work stoppages and sufficient supply of raw materials.

This is the year-end prediction of Walter S. Tower, president of the American Iron & Steel Institute.

Mr. Tower says "it is impossible to say precisely when a balance between supply and demand for all types of steel will be reached. It must inevitably come, since the current scale of demand must be regarded as abnormal and temporary. If a balance is not reached in 1948, certainly the expected high production of the year will bring it close."

The 1947 output was the largest tonnage ever produced in a peacetime year. Despite this, the supply of steel still is below current demand. Principal reason for the continued inability to meet all demands has been the loss of 18 million tons since the end of the war as the result of strikes and work stoppages.

Consumers Getting More—Nearly every major peacetime outlet is receiving more steel in 1947 than in 1940. Tonnages going to some major outlets are sharply higher than in that year. Steel is being supplied to more manufacturing firms, large and small, than ever before in history.

For example, jobbers, dealers and distributors, who supply steel in small quantities to thousands of small manufacturing plants or to oil companies, builders, contractors and others, are likely to receive a total of nearly 3,800,000 tons more steel in 1947 than in 1940. The function of the 1200 jobbers and distributors of steel is important. They are a vital link in the distribution channels from the nation's steel mills to users of steel. In 1947, they are likely to receive about 16.7 per cent of the total shipments of steel, against 14.6 per cent in 1940.

Shipments to Automakers Higher—Shipments of steel to the automotive industry in 1947 have been at an annual rate of 1,810,000 tons above 1940. Sheet and strip shipments to the automotive industry this year are at a rate of 978,000 tons above 1940.

The construction industry in 1947 is likely to receive 3,368,000 tons more steel than in 1940. That would be 13.4 per cent of the steel distributed in 1947, against 10.8 per cent in 1940.

Rail transportation, another large outlet, will receive more than one million tons more steel in 1947 than in 1940, according to preliminary estimates.

Nearly 2 million tons more steel than in 1940 will be shipped to the container industry in 1947. Makers of agricultural equipment will receive some 300,000 tons more steel than in that year. Shipments of steel to manufacturers of machinery and industrial equipment will be nearly 190 per cent higher.

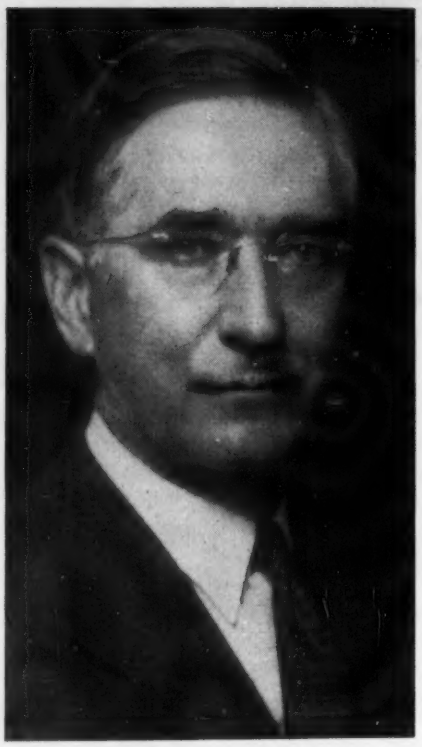
"Miscellaneous and unclassified" shipments will be about 2,800,000 tons larger in 1947 than in 1940 because some reporting companies were unable to adjust promptly to changes in form of reports. Therefore, if specific data were available on the distribution of this tonnage, then actual shipments to most industries would be even higher than the detailed tonnages indicate.

Exports Equal 1941—Shipments of semifinished and finished steel for export totaled 4,901,700 tons in the first nine months of 1947, according to Department of Commerce data. That indicates a total of about 6,500,000 tons for the whole year 1947, which will be roughly the same amount as exported in 1941 but below the totals for 1940, 1942 and 1943.

The examination of shipment figures for sheet and strip steel, which has been in such great demand since the war ended, reveals that every one of the major domestic outlets is receiving a greater tonnage than was shipped in 1940.

Jobbers, dealers and distributors, which supply to so-called "small businesses" a large part of their steel requirements, are receiving sheet and strip in 1947 at the rate of 341,000 tons more than in 1940. The agricultural industry is receiving sheet and strip at the annual rate of 414,000 tons in 1947, compared with 228,000 tons in 1940. The automotive industry is receiving sheet and strip at the rate of 978,000 tons above 1940.

Although the pattern of distribution of sheet and strip shipments among market groups in 1947 is roughly similar to the 1940 pattern, there are some variations in the percentage of the total shipped to various markets.



WALTER S. TOWER

Building Takes Larger Share—Construction is receiving 12.3 per cent of current sheet and strip shipments as against 6.9 per cent in 1940. Shipments to machinery manufacturers represent 8.2 per cent of 1947 sheet and strip shipments, compared with 5.0 in 1940.

In the other direction, the automotive industry is receiving 31.5 per cent of the 1947 total shipments of sheet and strip as against 37.5 per cent in 1940. The export market, which accounted for 7.5 per cent of all sheet and strip shipments in 1940, is receiving 2.8 per cent of the 1947 total.

Capacity Expanded—Large-scale expansion and improvement programs of steel companies, costing a total of about $1 billion, equal to nearly one-fifth of the capitalization of the industry, are being slowed by unavoidable delays in deliveries of equipment.

These programs are still growing. The latest estimates of the additions are as follows:

At least 3 million tons per year in improved and expanded steel ingot capacity. At the start of 1947 total annual capacity was 91,241,000 tons.

Approximately 3 million tons per year in improved and expanded pig iron capacity. At the beginning of 1947 total capacity was 65,709,000 tons per year.

About 3 million tons per year in improved and expanded coke ca-

pacity. At the start of 1947 total annual coke capacity of iron and steel companies was 60,280,000 tons.

More than 3 million tons per year in improved and expanded sheet and strip capacity. Total capacity cannot be stated on the same basis as the above figures. Production in 1947 is estimated to have been at least 18 million tons.

Technological Improvements — In addition to the expansion of physical facilities, steel companies are making technological experiments which may greatly improve production.

Experiments have indicated that higher production of pig iron can be obtained by increasing the amount of pressure exerted by blast furnace blowers and throttling exhaust gases.

The use of oxygen to speed steelmaking in open hearth furnaces may still be considered in the developmental stage, but several companies are committed to its use and they expect to obtain production benefits. In general, two main processes can be used. One process uses oxygen to enrich the flame of the open hearth, and the other process consists of injecting oxygen into the bath in the open hearth.

Melting time for open hearth steel can also be reduced by desiliconization of hot iron before charging it into the open hearth and by treatment of the hot metal for elimination of sulphur.

New light narrow strip mills can roll strip steel at a much faster rate than before the war. Moreover, the installation of faster motors in many existing mills will increase the rolling capacity of such mills. A new pipe mill is being built which is expected to permit the rolling of pipe at a faster rate than heretofore.

New methods of beneficiating iron ore have been devised. Improved coal-washing methods are being incorporated in new facilities now being installed.

New control mechanisms and new construction designs in furnaces and rolling mills will also help improve steel production methods.

Council Points to Need For Price Competition

"Real price competition" must be achieved and maintained if a balanced and long-range prosperity is to be had, the President's Council of Economic Advisers says in a year-end report to President Truman.

The council, headed by Edwin G. Nourse, defines such competition as "the lowest price consistent with a fair return in a stable economy, rather than the highest price the traffic will bear in an unstable economy.

"It seems clear that in reaching this equilibrium (of prosperity) many industrial prices must come down at least in relation to other prices," says the council. The nation is "by no means" in the stable balance of a high production economy, but is "abnormally" stimulated by overseas demands, the postwar backlog of unfilled consumer wants, crop shortages and continued high military expenditures, the council points out.

In a note of warning, the council raises the issue—"which we believe may have to be faced more definitely before the end of 1948"—of whether the problem of inflation and high living costs can be solved by production alone, or whether full production will overtake market demand, "force disastrous price breaks, result in production cutbacks, and thus prove to be its own undoing."

In seeking answers to the problem, the council says a speed-up in current output is no "panacea;" neither is the cure to be found in lengthening the work-week. "If we are to achieve and stabilize maximum production according to any reasonable interpretation of America's capacity to produce, we must in the future have much higher consumption in all the lower and middle ranks.

"The small number of the well-to-do will not be able to absorb the possible output of consumers' goods. The enlarging production of an industrially efficient nation must go increasingly to filling in the consumption deficiencies of the erstwhile poor," the council asserts.

In addition to lowering of prices by many industries, the achievement of a depression-free future, the council declares, will require that "many rates of profit must subside while reasonable profitability is established in other areas," and that "gross imbalances in the wage structure must be rectified."

The council's report also deplores labor slow-downs and "intentional restrictions of output." It indicates that the remedy lies in developing a "psychological security" based on the conviction there will be sufficient work for everyone. Achievement of freedom from fear of unemployment, the council declares, will require "effective programs of job placement, retraining, retirement and adequate social insurance."

Present, Past and Pending

TO REVIEW DECISION ON STEEL COMPANY SALE
WASHINGTON—The U. S. Supreme Court last week agreed to review a Delaware district court decision throwing out the government's suit to block purchase of Consolidated Steel Corp., Los Angeles, by Columbia Steel Co., a U. S. Steel Corp. subsidiary.

GE BUILDING 95 LOCOMOTIVES FOR ARGENTINA
SCHENECTADY, N. Y.—General Electric Co. is to supply Argentina with 95 diesel-electric locomotives in the next three years.

STEEL MILL EQUIPMENT MAKER EXPANDS
PITTSBURGH—Expansion of facilities for manufacturing rolling mill equipment has been completed at the Vandergrift, Pa., plant of United Engineering & Foundry Co.

BETHLEHEM STEEL CORP. BUYS TEXAS SHIPYARDS
NEW YORK—Pennsylvania Shipyards Inc., Beaumont, Tex., has been purchased by Bethlehem Steel Corp. The yards have six ways.

MACHINE TOOL SHIPMENTS DECLINE IN NOVEMBER
CLEVELAND—Estimated shipments of the machine tool industry declined to $24,503,000 in November from October's $27,545,000. Declines also occurred in new orders, both domestic and foreign.

LINCOLN ELECTRIC BONUSES TOTAL $3,800,000
CLEVELAND—Lincoln Electric Co. in its 1947 annual bonus distribution gave 1155 workers $3,800,000. Checks ranged from $25 for short-time employees to $35,000 for top managerial and engineering talent.

GETS $1 MILLION ORDER FOR ENAMELING FURNACES
CHICAGO—Lindberg Engineering Co. has been awarded a million-dollar contract for five electric enameling furnaces for Lustron Corp., Columbus, O., manufacturer of houses of vitreous enameled steel.

NON-FERROUS INSTITUTE CHANGES NAME
CHICAGO—Non-Ferrous Ingot Metal Institute, 308 West Washington St., has changed its name to Brass & Bronze Ingot Institute.

Blast Furnace Capacity Rises

Approximately 1,500,000 tons additional made available in 1947 compared with total at beginning of year. Another 1,500,000 tons under construction

BLAST furnace capacity in the United States as of Jan. 1, 1948, is approximately 1,500,000 tons higher than reported by the American Iron & Steel Institute for Jan. 1, 1947, and is scheduled to increase another 1,500,000 tons as soon as furnaces under construction are ready for operation.

This increase will be reduced somewhat, however, should business level off, as some furnaces are overdue for scrapping.

Some time during 1948, the Institute is expected to issue a report on capacities of individual companies, bringing up to date the figures released for Jan. 1, 1945, and published in STEEL Dec. 17, 1945. In the meantime, STEEL presents on page 23 figures for each company computed by taking the Jan. 1, 1945, figures as a base and making adjustments as reported by individual companies and in the Institute's annual statistical reports.

Includes Charcoal Stack — The figure of 66,209,790 tons for coke pig iron capacity in the page 23 table includes the 32,480-ton capacity of the lone charcoal stack in the United States. It also should be pointed out that the Institute reported ferroalloy capacity at 1,002,700 tons on Jan. 1, 1947, apparently due to minor upward adjustments for some furnaces in the preceding two years. In the small table showing comparative total capacities, the adjusted figure for ferroalloys is used rather than the one from the large table, the latter being identical with that for Jan. 1, 1945.

The United States Steel Corp. has 76 pig iron furnaces currently, compared with 78 three years ago. Not included in the total are two new furnaces now under construction at Carnegie-Illinois' South Chicago plant. One furnace has been taken off the list at South Chicago and two at Braddock, Pa. A furnace at Duquesne, slated to be taken off, is still operating.

Adding New Stack — Bethlehem is building one new furnace at Sparrows Point, not included in the table, which will more than offset one taken off at Lackawanna. Wheeling Steel Co. scrapped its Martins Ferry, O., furnace and sold the Portsmouth, O., furnace. Inland Steel Co. has purchased two government-built stacks to bring its total up to eight. Ford is building a new furnace which will be ready in about a year. Colorado Fuel & Iron Corp. has purchased some government coke ovens and now is able to operate all four of its furnaces. Pittsburgh Steel Co. bought a government-owned furnace recently, bringing its total to three.

BLAST FURNACE CAPACITY

(As reported by the American Iron & Steel Institute through 1947. The 1948 figure is estimated by STEEL, net tons.)

As of Jan. 1	Coke Pig Iron	(Net Tons) Charcoal Pig Iron	Ferroalloys	Total
1948	66,177,310	32,480	1,002,700	67,212,490
1947	64,674,020	32,480	1,002,700	65,709,200
1946	66,311,410	32,480	996,700	67,340,590
1945	66,256,810	64,480	992,600	67,313,890
1944	66,344,780	56,190	990,300	67,391,270
1943	62,859,330	107,200	967,000	63,933,530
1942	59,211,850	106,560	1,075,570	60,393,980
1941	56,522,370	106,560	980,660	57,609,590
1940	54,635,740	95,580	992,320	55,723,640
1939	55,162,374	103,040	1,060,416	56,325,830
1938	55,618,752	103,040	1,060,416	56,782,208
1937	54,418,489	103,040	1,035,776	55,557,305
1936	54,803,720	103,040	947,520	55,854,280
1935	55,999,710	150,640	947,520	57,097,870
1934	56,209,620	150,640	883,008	57,243,268
1933	55,452,964	159,040	898,688	56,510,692

Sale of Empire Steel To Studebaker Approved

Stockholders of Empire Steel Corp., Mansfield, O., on Dec. 19 approved sale of their company for $7,430,000 to the Studebaker Corp., South Bend, Ind. The vote showed 92,421 shares in favor of the sale and 13,101 opposed. There are 117,000 shares outstanding. Transfer becomes effective Jan. 1.

The Empire company is the outgrowth of the National Steel Co. organized in Mansfield in 1912. It began operations in a plant consisting of three hot mills, but today the plant is spread over a large acreage with numerous buildings. Some time ago it was announced the company planned to increase its steel output by 25,000 tons annually, the program being part of a 3-year multimillion dollar project.

The company reported net profits for the nine months ended Sept. 30 of $1,295,000, largest in the company's history. Net sales for the period were $14,660,000, while its total sales in 1946 were $11,930,000.

The company produces steel ingots; sheet bars; hot-rolled, hot-rolled pickeled, special black, electrical and long terne sheets. It has six open-hearth furnaces with capacity for producing 348,540 tons of ingots annually. Finished product capacity consists of 120,000 tons of hot-rolled sheets, and 14,400 tons of long ternes.

Sale of the Empire plant to Studebaker marks the passing of another small independent steel producing interest to a large steel consumer. As a result of such transfers over the past year or so only a few small, nonintegrated mills remain as entities.

Currently it is reported at least six additional deals are in negotiation looking to acquisition of steel plant properties, or the setting up of new steel plants by automotive and other consuming interests. However, last week officials of the Follansbee Steel Corp., Pittsburgh, emphatically denied their company was in any such deal. Recent unexplained activity in Follansbee stock may have given rise to the rumors, which included acquisition by Sears, Roebuck & Co., Youngstown Sheet & Tube Co., Jones & Laughlin Steel Corp., and the Du Pont interests.

Republic Steel Buys Two West Virginia Coal Firms

Republic Steel Corp., Cleveland, has purchased Standard Fire Creek Coal Co. and Fire Creek Coal Co., Beckley, W. Va., which own and operate coal mines at Beelick Knob and Jon Ben, W. Va. Together these mines comprise roughly 2500 acres of Pocahontas No. 4 and No. 6 coal.

Koppers Keeps St. Paul Coke Ovens in Operation

Koppers Co. Inc., Pittsburgh, has contracted with Northern States Power Co. to use gas from its St. Paul coke plant and will thus be able to continue operations at this facility even after the city turns to the use of natural gas next spring, it has been announced by M. T. Herried, Koppers vice president.

BLAST FURNACE CAPACITY IN THE UNITED STATES

(This compilation of current capacities is based upon the American Iron & Steel Institute's Directory of Iron and Steelworks for 1945, the Institute's Annual Statistical report for 1946 and information obtained from individual companies)

Companies	Coke Pig Iron No. of Stacks	Coke Pig Iron Annual Capacity	Ferroalloys No. of Stacks	Ferroalloys Annual Capacity	Total Annual Capacity
Alan Wood Steel Co., Swedeland, Pa.	2	454,800	..	.....	454,800
American Rolling Mill Co. Total	6	1,588,000	..	.....	1,588,000
Ashland, Ky	3	750,000	..	.....	750,000
Hamilton, O.	2	564,000	..	.....	564,000
Sheffield Steel Corp., Div., Houston, Tex.	1	274,000	..	.....	274,000
Bethlehem Steel Co. Total	28	9,150,000	2	180,000	9,330,000
Bethlehem, Pa.	7	1,920,000	..	.....	1,920,000
Steelton, Pa.	3	792,000	..	.....	792,000
Johnstown, Pa.	5	1,494,000	2	180,000	1,674,000
Sparrows Point, Md.	7[1]	2,712,000	..	.....	2,712,000
Lackawanna, N. Y.	6	2,232,000	..	.....	2,232,000
Brooke (E. & G.) Iron Co., Birdsboro, Pa.	1	137,890	..	.....	137,890
Colorado Fuel & Iron Co., Denver, Colo. Total	6	1,340,000	..	.....	1,340,000
Pueblo, Colo.	4	950,000	..	.....	950,000
Wickwire Spencer Steel Div., Tonawanda, N. Y.	2	390,000	..	.....	390,000
Crucible Steel Co. of America, Midland, Pa.	2	532,000	..	.....	532,000
Eastern Gas & Fuel Assoc., Everett, Mass.	1	176,400	..	.....	176,400
Ford Motor Co., Dearborn, Mich.	2[2]	504,000	..	.....	504,000
Globe Iron Co. Jackson, O.	..	.....	1	84,000	84,000
Inland Steel Co., Indiana Harbor, Ind.	8	2,929,000	..	.....	2,929,000
Interlake Iron Corp. Total	6	1,332,500	..	.....	1,332,500
Erie, Pa.	1	165,300	..	.....	165,300
S. Chicago, Ill.	2	520,100	..	.....	520,100
Toledo, O.	2	520,100	..	.....	520,100
Duluth	1	127,000	..	.....	127,000
International Harvester Co., S. Chicago, Ill.	3	719,710	..	.....	719,710
Jackson Iron & Steel Co., Jackson, O.	..	.....	1	90,000	90,000
Jones & Laughlin Steel Corp. Total	13	4,080,000	..	.....	4,080,000
Aliquippa, Pa.	5	1,800,000	..	.....	1,800,000
Cleveland	2	480,000	..	.....	480,000
Pittsburgh	6	1,800,000	..	.....	1,800,000
Kaiser Co. Inc., Fontana, Calif.	1	388,800	..	.....	388,800
Lavino (E. J.) & Co. Total	..	.....	2	72,000	72,000
Sheridan, Pa.	..	.....	1	36,000	36,000
Lynchburg, Va.	..	.....	1	36,000	36,000
Lone Star Steel Co., Daingerfield, Tex.	1	399,850	..	.....	399,850
Missouri-Illinois Furnaces Inc., Granite City, Ill.	2	465,000	..	.....	465,000
National Steel Corp. Total	9	2,894,180	1	120,000	3,014,180
Great Lakes Steel Corp., Detroit	3	1,100,000	..	.....	1,100,000
Hanna Furnace Corp., Buffalo	3	594,180	1	120,000	714,180
Weirton Steel Co., Weirton, W. Va.	3	1,200,000	..	.....	1,200,000
New Jersey Zinc Co., Palmerton, N. J.	..	.....	2	134,400	134,400
Pittsburgh Coke & Chem. Co., Neville Island, Pa.	1	291,600	..	.....	291,600
Pittsburgh Steel Co., Monessen, Pa.	2	986,000	..	.....	986,000
Portsmouth Steel Co., Portsmouth, O.	1	285,000	..	.....	285,000
Republic Steel Corp. Total	21	6,324,000	..	.....	6,324,000
Birmingham, Ala.	2	376,000	..	.....	376,000
Gadsden, Ala.	2	471,000	..	.....	471,000
South Chicago, Ill.	1	450,000	..	.....	450,000
Buffalo	2	565,000	..	.....	565,000
Troy, N. Y.	1	263,000	..	.....	263,000
Canton, O.	1	235,000	..	.....	235,000
Cleveland	5	1,659,000	..	.....	1,659,000
Massillon, O.	1	238,000	..	.....	238,000
Warren, O.	1	450,000	..	.....	450,000
Youngstown, O.	5	1,617,000	..	.....	1,617,000
Sharon Steel Corp. Total	3	757,600	..	.....	757,600
Lowellville, O.	1	173,600	..	.....	173,600
Farrell, Pa.	2	584,000	..	.....	584,000
Shenango Furnace Co., Sharpsville, Pa.	2	417,300	..	.....	417,300
Sloss-Sheffield Steel & Iron Co. Total	3	386,470	1	36,800	423,270
Birmingham	2	281,230	..	.....	281,230
North Birmingham, Ala.	1	105,240	1	36,800	142,040
Struthers Iron & Steel Co., Struthers, O.	1	181,400	..	.....	181,400
Tennessee Products Corp. Total	1	32,480	1	21,900	54,380
Lyle, Tenn.	1[3]	32,480	..	.....	32,480
Rockwood, Tenn.	..	.....	1	21,900	21,900
Tonawanda Iron Corp., No. Tonawanda, N. Y.	1	171,000	..	.....	171,000
U. S. Steel Corp. Total	76	24,456,600	3	253,500	24,710,100
American Steel & Wire Co. Total	6	1,429,400	..	.....	1,429,400
Duluth	2	449,400	..	.....	449,400
Cleveland	2	530,000	..	.....	530,000
Donora, Pa.	2	450,000	..	.....	450,000
Carnegie-Illinois Steel Corp. Total	48	16,303,200	3	221,900	16,525,100
South Chicago, Ill.	10[4]	3,401,600	..	.....	3,401,600
Gary, Ind.	12	4,402,700	..	.....	4,402,700
Youngstown, O.	6	1,837,800	..	.....	1,837,800
Braddock, Pa.	6	2,421,800	..	.....	2,421,800
Clairton, Pa.	2	528,700	1	77,000	605,700
Duquesne, Pa.	6	1,577,600	..	.....	1,577,600
Etna, Pa.	..	.....	2	144,900	144,900
Rankin, Pa.	6	2,133,000	..	.....	2,133,000
Geneva Steel Co. Total	4	1,349,200	..	.....	1,349,200
Geneva, Utah	3[5]	1,150,000	..	.....	1,150,000
Provo, Utah	1	199,200	..	.....	199,200
National Tube Co. Total	9	3,042,400	..	.....	3,042,400
Lorain, O.	5	1,764,400	..	.....	1,764,400
McKeesport, Pa.	4	1,278,000	..	.....	1,278,000
Tennessee Coal, Iron & R.R. Co. Total	9	2,332,400	..	31,600	2,364,000
Ensley, Ala.	6[6]	1,347,500	..	31,600	1,379,100
Fairfield, Ala.	3	984,900	..	.....	984,900
Wheeling Steel Corp. Total	3	846,000	..	.....	846,000
Benwood, W. Va.	1	234,000	..	.....	234,000
Steubenville, O.	2	612,000	..	.....	612,000
Woodward Iron Co., Woodward, Ala.	3	526,170	..	.....	526,170
Youngstown Sheet & Tube Co. Total	12	3,456,000	..	.....	3,456,000
Campbell, O.	4	1,450,800	..	.....	1,450,800
Hubbard, O.	1	200,400	..	.....	200,400
Youngstown, O.	2	501,600	..	.....	501,600
East Chicago, Ind.	2	619,200	..	.....	619,200
South Chicago, Ill.	3	684,000	..	.....	684,000
GRAND TOTAL	222	66,209,790	14	992,600	67,202,390

[1] Does not include new 1800-ton a day furnace scheduled to go into blast Feb. 1, 1948.
[2] A third furnace will be completed in about a year.
[3] Charcoal furnace.
[4] Does not include 2 furnaces under construction with 520,200 tons capacity each.
[5] One furnace of 383,400 tons capacity not operating due to shortage of coke.
[6] Furnace producing ferroalloys is included under pig iron.

Union Group Meets with U.S. Steel

DEVELOPMENT of friendly and co-operative relationships between the company and the union and among all employees at all levels was announced as the purpose of the regular quarterly meetings of the steel producing subsidiaries of United States Steel Corp. and the United Steelworkers of America (CIO) as they began their second meeting recently in Pittsburgh.

J. A. Stephens, vice president, industrial relations, U. S. Steel Corp. of Delaware, in opening the meeting stressed as its purpose the appraisal of problems which may have arisen in the application, administration and interpretation of the labor agreement of Apr. 22, 1947, and was not for the purpose of conducting collective bargaining nor in any way to nullify the provisions of the agreement.

A sweeping picture of the $500 million modernization and expansion program now under way at subsidiaries' plants was presented by B. H. Lawrence, vice president, engineering, U. S. Steel Corp. of Delaware. In outlining the scope of the program which includes nearly 1000 separate projects, he emphasized the increased cost of new facilities by saying that to add a ton of finished steel product capacity now costs $300, more than ever before, compared with $60 or $70 forty years ago.

Other efforts being made by the companies to increase steel and iron output, as mentioned by Mr. Lawrence, include the intensive searches being made to find new sources of iron ore and the beneficiation program being conducted on low grade Minnesota ore. Two large coal washing plants, now under construction by U. S. Steel in Pennsylvania and West Virginia, were also cited, Mr. Lawrence saying that a 4 to 5 per cent increase in output of iron will result from the improved quality of coal the plants will produce when put in operation in 1948.

ARBITRATION CHIEF: New chairman of the United States Steel Board of Conciliation & Arbitration is Ralph T. Seward, center, until recently permanent umpire under the General Motors-United Auto Workers agreement. Pictured with him in the board's hearing room in Pittsburgh are Walter J. Kelly, left, U. S. Steel committee member, and Eugene Maurice, representing the United Steelworkers

Five vice presidents of subsidiaries who gave detailed talks on construction within their companies were: A. V. Weibel, Tennessee Coal, Iron & Railroad Co.; E. N. Sanders, National Tube Co.; Lee Pringle, Columbia Steel Co.; H. B. Jordan, American Steel & Wire Co.; and J. E. Lose, Carnegie-Illinois Steel Corp.

Philip Murray, USA president, presided at the meeting.

President Truman Names Labor-Management Panel

A national labor - management panel to work with the Federal Mediation & Conciliation Service as stipulated in the Taft-Hartley Act has been appointed by President Truman.

He named these six management members: James Black, president, Pacific Gas & Electric Co.; Benjamin Fairless, president, United States Steel Corp.; Paul G. Hoffman, president, Studebaker Corp.; George M. Humphrey, president, M. A. Hanna Co.; Lewis Lapham, president, American-Hawaiian Steamship Co.; and Charles E. Wilson, president, General Electric Co.

From labor, the president appointed: Harvey B. Brown, president, International Machinists Union; Clinton S. Golden, chief of the labor division of the American Mission for Aid to Greece; William Green, president, American Federation of Labor; Philip Murray, president, Congress of Industrial Organizations; Alan S. Haywood, CIO vice president; and William L. Hutcheson, president of the AFL Carpenters Union.

Calendar of Meetings . . .

Jan. 8. American Supply & Machinery Manufacturers Association and National and Southern Supply & Machinery Distributors' Associations: Joint regional meeting, Edgewater Gulf Hotel, Biloxi, Miss.

Jan. 12-13. Industrial Furnace Manufacturers Association: Mid-winter meeting at Hotel Schenley, Pittsburgh. Association headquarters are at 420 Lexington Ave., New York

Jan. 12-14: Truck-Trailer Manufacturers Association: Seventh annual meeting, Edgewater Gulf Hotel, Edgewater Park, Miss. Association secretary-manager is John B. Hulse, 809 National Press Bldg., Washington.

Jan. 12-16: Society of Automotive Engineers: Annual meeting and engineering display, Book-Cadillac Hotel, Detroit. Society secretary is John A. C. Warner, 29 W. 39th St., New York.

Jan. 12-16: Rensselaer Polytechnic Institute: Industrial Personnel Testing Conference, Troy, N. Y.

Jan. 12-16. Second National Materials Handling Exposition: Public Auditorium, Cleveland.

Jan. 13-14. American Society of Mechanical Engineers: Special national session of materials handling and management divisions in conjunction with Materials Handling Show. Meeting headquarters will be at Hotel Statler, Cleveland.

Jan. 14. American Supply & Machinery Manufacturers' Association and National Supply & Machinery Distributors' Association: Joint regional meeting, Copley Plaza, Boston.

Jan. 16-21: Canning Machinery & Supply Association: Exposition, Municipal Auditorium, Atlantic City, N. J.

Jan. 19-20. Institute of Scrap Iron & Steel Inc.: 1948 convention, Congress Hotel, Chicago. Institute executive secretary is Edwin C. Barringer, Normandy Bldg., Washington.

Jan. 21-24, American Society of Civil Engineers: Annual meeting, Hotel Commodore, New York. Society headquarters are at 33 W. 39th St., New York.

Jan. 26-28, American Road Builders' Association: 45th annual convention, Washington, D. C. Association headquarters are in the International Bldg., Washington.

Jan. 26-29, Refrigeration Equipment Manufacturers Association: 5th all-industry refrigeration and air conditioning exposition, Cleveland.

Jan. 26-30. American Standards Association: Seminar on standardization work and writing of standard specifications at Engineering Societies Bldg., New York.

Jan. 26-30: American Institute of Electric Engineers: Winter general meeting at Pittsburgh. Institute headquarters are at 33 W. 39th St., New York.

Foreign Trade Gains in October

Commerce Department reports increases in both imports and exports by U. S. Nation's exports of iron and steel products in first nine months set at 4,901,708 tons

VALUE of exports from the United States to every continent was higher in October than in September, the total volume rising more than 11 per cent from $1,099.9 million to $1,225.7 million. Imports also increased in October to $491.5 million, a gain of 2 per cent from the previous month, the Bureau of the Census, Department of Commerce, reports.

Noteworthy in the increases in foreign trade was that of exports from the United States to other countries on the North American continent. These exports at $366.9 million for October were at an all-time high.

European Shipments Gain—Exports to Europe, which had declined to the year's low in September after attaining an unusually high peacetime rate during the first half of the year, rose $10.5 million in October to $404.6 million. Countries showing the largest increases were: Belgium $44.6 to $61.7 million, United Kingdom $89.8 to $94.5 million, Netherlands $27.1 to $31.5 million, and Russia $3.0 to $9.2 million. Sharpest declines in European imports were by these countries: Greece from $14.3 to $9.9 million, France from $64.5 to $58.2 million, Sweden $36.8 to $27.1, and Norway $12.5 to $7.2 million.

Value of goods imported by the United States from South America reached the highest level on record in October at $120.0 million. Notwithstanding a sharp decline in imports from Russia from a postwar high of $14.0 million in September to $7.8 million, total imports from Europe advanced slightly to $78.8 million, a $2 million gain over September. Italy, Norway and the United Kingdom, in particular, increased their exports to the U. S. during the month. Imports from Asia rose $12.1 million during the month to $83.9 million.

Ferrous Exports Reported — Exports of iron and steel products by the United States during the first nine months of the year, as reported by the Commerce Department, totaled 4,901,708 net tons. Largest tonnage shipped during that period was of structural shapes—560,634 tons. Shipments of black steel sheets amounting to 431,943 tons were made through September to place this product in second place. Third largest tonnage was of unfabricated plates, with 427,220 tons exported. At 414,779 tons, hot-rolled carbon bars were in fourth place with tin plate and tagger's tin close behind at 414,287 tons for the period. Exports of ingots, blooms, billets, slabs and sheet bars ranked sixth in export tonnage at 356,634 tons. Detailed statistics of iron and steel exports for July, August and September and totals for the first nine months of 1947 are shown in the accompanying table.

Round Table To Discuss Canadian Import Controls

A round table meeting on Canadian import controls to go into effect next month on machinery, metals and raw materials will be held by the Cleveland World Trade Association Jan. 8 in the Union Commerce Bldg., Cleveland.

The panel to discuss the latest information on this subject includes: Frederic L. Roberts, chief of the World Trade Division, Department of Commerce, chairman; Howard L. Young, district freight agent for the Canadian-Pacific Railway; and J. F. Gleichauf, associate director of Cleveland World Trade Association.

U. S. Files Antitrust Suit Against Du Pont

Department of Justice has filed an anti-trust suit charging E. I. du Pont de Nemours Inc., Wilmington, Del., with unlawfully monopolizing the U. S. cellophane industry.

Six foreign corporations, though not defendants, are named as co-conspirators with the defendant du Pont company. They are: LaCellophane, S.A., France; British Cellophane Ltd., England; Canadian Industries Ltd., Canada; Kalle & Co. A.G., Germany; Societe de La Viscose Francaise, France; and Viscose Development Co. Ltd., England.

U.S. EXPORTS OF IRON AND STEEL

(Net Tons)

Semi-Finished and Finished Products:	July	August	September	First Nine Months—1947
Ingots, blooms, billets, slabs, sheet bars	38,645	37,483	41,962	356,634
Wire rods	4,215	5,104	7,013	47,620
Skelp	2,644	4,293	7,488	52,616
Iron bars	3,522	3,235	2,410	31,998
Concrete reinforcement bars	17,414	20,700	24,982	194,003
Steel bars, cold finished	8,975	8,344	8,548	78,180
Other steel bars (excluding alloy)	37,386	42,064	42,337	414,779
Alloy steel bars	17,479	22,302	13,827	164,721
Welding rods, electric	1,544	1,371	1,285	10,444
Boiler plate	2,052	2,237	1,091	28,349
Other plates, not fab.	38,638	40,495	41,287	427,220
Plates, fab., punched or shaped	4,390	2,809	2,976	26,787
Iron sheets, black	2,049	3,316	1,997	23,480
Steel sheets, black	43,980	47,776	41,924	431,943
Galvanized sheets	7,304	5,839	5,932	59,808
Strip steel, cold rolled	8,587	6,877	7,694	67,783
Strip steel, hot rolled	5,666	7,205	8,203	80,738
Tin plate and tagger's tin	47,802	49,165	42,794	414,287
Terne plate (incl. long ternes)	1,095	903	834	9,021
Structural shapes, plain	52,322	58,081	60,400	560,634
Structural shapes, fab.				
Frames and sashes	4,568	1,995	2,883	27,151
Sheet piling				
Rails, 60 lbs. per yard and over				
Rails, less than 60 lbs. per yard	41,095	48,067	43,621	357,338
Rails, relaying				
Splice bars and tie plates				
Frogs and switches	12,317	18,809	16,149	116,020
Railroad spikes				
Railroad bolts, nuts, and washers				
Car wheels, tires and axles	5,241	3,710	5,435	68,805
Seamless black pipe	1,681	1,401	1,891	13,149
Seamless casing and oil line pipe	28,418	12,583	23,706	230,998
Seamless boiler tubes	5,828	5,203	5,784	49,617
Welded black pipe	7,051	6,546	5,776	74,410
Welded galvanized pipe	5,008	5,919	4,997	54,536
Welded casing and oil line pipe	*	*	*	*
Welded boiler tubes	*	*	*	*
Other pipe and fittings	10,461	11,174	10,292	74,547
Plain wire	5,871	7,221	7,287	60,034
Galvanized wire	8,053	10,089	8,892	72,614
Barbed wire	6,890	5,958	5,802	55,626
Woven wire fencing	1,032	779	658	9,195
Woven wire screen cloth	498	424	564	4,471
Wire rope and strand	2,083	1,498	1,341	26,165
Wire nails	2,220	2,356	2,181	18,580
Other wire and manufactures	4,334	4,244	4,060	36,800
Horseshoe nails				
Tacks	1,590	1,304	1,369	10,900
Other nails, incl. staples				
Bolts, nuts, rivets and washers, except railroad	3,581	4,157	4,392	33,680
Forgings	3,685	2,782	2,830	25,168
Horseshoes	114	35	116	859
TOTAL	507,328	525,853	525,010	4,901,708

*Included with seamless.

Source: United States Department of Commerce.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Amendments to Wage-Hour Act to be considered in January. Some seasonal industries may be granted exemptions from overtime payments

AMENDMENTS to the Fair Labor Standards Act will be adopted in 1948 if the McConnell subcommittee of the House Education & Labor Committee has its way. The subcommittee now has completed an extended series of hearings and is all set, immediately on the reconvening of Congress in January, to go into executive session in order to go over the whole act point by point. It hopes to report to the full committee before the end of January and submit a bill by that time.

A good probability is that the subcommittee will grant widespread exceptions to overtime payment for more than 40 hours. Representatives of many industries like ice, beer, canning, textile and others that have peak seasons showed that they carry a good many employees over quiet periods when they work short hours, and subcommittee believes overtime premium payments work inequitably in such cases and encourage employers to lay off workers that otherwise might stay secure in their jobs throughout the year.

On the other hand, where employment is uniform throughout the year the 40-hour week probably will continue the base with time-and-a-half for overtime.

Relaxation of the overtime provision in the case of clerks, stenographers and other office workers which will permit a balancing of busy days or weeks against slack periods without necessitating overtime payments for hours worked in excess of present maximums is likely.

Duties To Be Clarified — In an effort to remove present differences of opinion between the Wage-Hour Administrator and such other government agencies as the Department of Justice and the Bureau of Internal Revenue, the subcommittee may more closely define the duties and responsibilities of the administrator and sharply narrow the area within which he may use his own judgment. In fact, such action was recommended by Wage-Hour Administrator McComb. The subcommittee almost surely will undertake to spell out definitions of "regular pay," "bonus pay," "overtime," etc., to remove present uncertainty, as in the case where the administrator ruled that certain overtime paid to stevedores should be counted in their regular pay. As part of this effort the subcommittee may recommend outlawing of many types of suits involving back pay.

Most uncertainty has to do with such action as the subcommittee may take with reference to the minimum wage. Secretary Schwellenbach called for an increase to 75 cents an hour in the minimum wage; however, many industries showed that the existence of a minimum wage serves mainly to give extra bargaining leverage to the higher-income workers. The subcommittee has talked of a compromise rate, such as 65 cents, but nothing under this head yet is certain.

VARIETY NEEDED: RFC Chairman John D. Goodloe told the Senate Banking & Currency Committee that his organization's history on veterans' loans has been "disappointing" because the public does not like the appearance of standardized prefabricated houses. Several manufacturers have held up production, he said, while they sought to improve variety of design. NEA photo

To Review Control List

Office of International Trade Review Committee, the interdepartmental government group that decides allocations of scarce materials under the export control program, is prepared to re-examine the entire controlled commodity list, and the tonnages allotted for export, as soon as Secretary Marshall reports to the White House and newly raised export policy questions are settled. What the Review Committee needs particularly is definite information on what commodities, in what quantities, are to be shipped to Europe under the Marshall Plan. Involved, of course, are requests for large tonnages of steel, pig iron and scrap.

Oppose Shipments to Russia — While the administration seeks to continue avoiding irritation of the Soviet leaders, Congress may force a change. Recent congressional debate has brought out numerous expressions of resentment against the Russians and almost each issue of the *Congressional Record* contains newspaper editorials, radio broadcasts and similar expressions demanding that we quit sending machinery to Russia.

Latest move is House approval of a resolution by Rep. Francis Case (Rep., S. Dak.) calling on the State Department and Army for full explanation of the shipment of dismantled German plants to Russia. The objective, Representative Case said, is to "stop this country from shipping further dismantled plants to the Soviet Union."

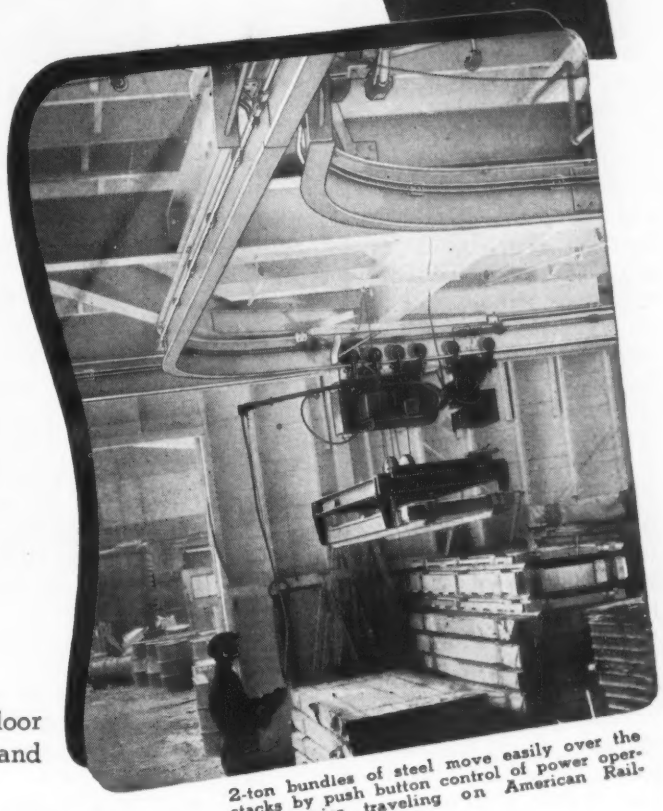
No Pig Iron for Italy—A check reveals that contrary to recent news and radio reports no pig iron has been allocated for export to Italy; these news reports erroneously stated that 100,000 tons of pig iron were to be shipped to Italy. Pig iron continues in the "closed quota" classification—meaning that pig iron is not subject to the setting of regular export quotas. The Review Committee has the power to consider applications based on appeals of extreme emergency or acute need—but has not granted any pig iron export applications whatever for some time.

More Funds for Aviation

Sen. Owen Brewster (Rep., Me.), chairman, Aviation Policy Board,

Steel goes UP and OVER

Sheet steel is picked up from truck by a special grab and electric hoist. American MonoTractor propels the load across the jib and into warehouse.



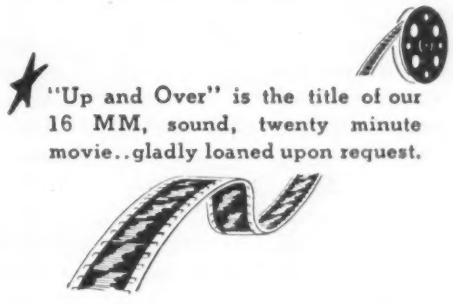
2-ton bundles of steel move easily over the stacks by push button control of power operated carrier traveling on American Rail-Master Track.

Hundreds of plants are eliminating much of their floor congestion by installing American MonoRail "Up and Over"* Handling Systems.

In these particular plants steel goes up from truck, is transported overhead, and stacked in high piles for subsequent fabrication. Increased production at lower costs has resulted.

With "Up and Over" type of handling, from receiving to shipping, an overhead track or crane system does a better, quicker job with less maintenance.

Let an American MonoRail engineer show you how an overhead system will increase your production and pay for itself in a very short time.



*"Up and Over" is the title of our 16 MM, sound, twenty minute movie..gladly loaned upon request.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE **CLEVELAND 7, OHIO**

says the board will not attempt to file a report to Congress until close to the due-date, which is March 1, 1948. But he served an ominous warning that the board will recommend a program which will be much more costly to taxpayers than the present program.

"It becomes more and more apparent that in order to remain superior in the air, which is the route through which we are most likely to be attacked," said Senator Brewster, "one of the recommendations of the board will call for greatly increased expenditures which will far exceed the current aviation budget."

The board has set up four subcommittees, on manufacturing, transportation, combat, and government organization, has appointed an advisory council and has completed organization of an adequate staff.

AVAILABLE AT A PRICE: This Bentley convertible coupe is one of seven custom-built models brought to the United States by Rolls-Royce Ltd. for showing in major American cities. The Bentleys range in price from $12,900 to $17,700, and their design reminds American observers of our prewar models. NEA photo

Mission To Study European Scrap

Responses received by Rep. Lindley Beckworth (Dem., Tex.) to an inquiry as to amount of scrap in Europe available for shipment to the United States are very much in line with recent statements by Army officers and other informed parties to the effect that no undue spirit of optimism should be built up on the prospects.

How much scrap is there, said David Bruce, assistant secretary of commerce, is a moot question to which no one has the answer and it is to get the real facts, both as to the possibility of shipping scrap to the United States, and as to the supply of metallics available to German industry for implementation of the Marshall Plan, that Secretary Harriman is sending a scrap mission to the United States-occupied zone on Dec. 30. But Mr. Bruce warns that even should large tonnages of scrap be uncovered there are highly complex problems to be solved before the disposition of the scrap can be decided.

Collection Difficult—"Even if the mission found large tonnages of scrap," said Mr. Bruce in his letter, "it would not necessarily mean that it could be made readily available to steelmakers either in Europe or in this country. One very great obstacle is the absence in Europe of national organizations comparable to the American scrap industry capable of collecting, processing, and transporting any quantity of scrap. Another is the inadequacy of existing equipment to carry on the above and to load scrap on board ships for carriage overseas. Solutions to both these problems would have to be found if any very great tonnage in addition to that now being used is to be brought out.

"Finally, as far as bringing European scrap to this country is concerned, there is the problem of arranging for its purchase. Only scrap generated by the American Army—demilitarized materiel of war for the most part—is actually the property of the United States. All the rest, including rubble scrap in the American zone of Germany, is the property of the countries in which it is located. Any of this last would first have to be purchased from its present owners before it could be brought to this country and since most of the countries of western Europe consider scrap an essential national resource they are understandably loath to permit its exportation."

Shortage in Europe—Less hopeful was the general tenor of a letter from Florence Kirlin, a special assistant in the State Department. This, in part, was as follows:

"The possibility of obtaining European scrap as return cargo has been a subject of widespread interest in recent weeks. Investigation has shown, however, that western Europe is suffering from a shortage of scrap more serious than our own. In fact, the report of the Committee of European Economic Co-operation estimates that a deficit in European scrap supplies of at least one and one-half million tons will exist in each year of the period 1948-51.

"Although the potential supply of scrap in western Europe may be large, much of it is in inaccessible locations, and much of it is rubble scrap, and the collection and transportation of such materials involve extreme difficulties in the present state of the European economy. In Germany, which is presumed to be the richest source of European scrap, the obstacles to the organization of a successful collection program are particularly serious. In the meantime, presently available supplies of steel scrap in western Europe are inadequate for local requirements. In certain areas, notably Italy and Austria, stocks are so low that there is danger of an enforced reduction of even the present low levels of production and employment in the steelmaking and fabricating industries of these countries. There are considerable quantities of United States Army scrap in overseas theaters which might be used to alleviate this situation, but a present directive requires that this material be sold only for return to this country.

"You will understand that in these circumstances the department does not wish at the present time to press for shipment of indigenous scrap from Europe to this country. If, at a later date, we ascertain that there is surplus scrap abroad which could be shipped to the United States without such serious detriment to the European economy, considerations of a change of policy will of course be in order."

Red-Inspired Strikes Hit France

Rising prices and communist leaders bring French economy near disaster. Government takes strong measures against anti-work movement

PARIS, FRANCE

MORE THAN a month of communist-inspired labor turmoil has set France back more than two months in its production timetable and any chances of an economic uptrend this winter have been virtually wrecked.

Estimates in early December set the loss in French coal output at 1.6 million tons since the miners walked out. The crippling effects of the strikes have been felt in every section of industry; automobile output has been cut by an estimated 50 per cent and textile production is down by 30 per cent. Money losses have been figured at 25 per cent of the national revenue. An estimate by the General Confederation of Labor (CGT) places French losses by the strikes at $92 million.

Inflation in France is the best ally of the communists. Workers' wages are daily being whittled by rising prices, making it impossible, however, to dismiss the demands of the communist-led CGT as purely political. It is this real grievance and genuine discontent which the communists are exploiting at a strategic moment.

In making its bid to seize power, the communist party, after the rebuff in the recent municipal elections, is now attempting to paralyze the economy of France in order that stop-gap aid from the United States will arrive too late. The country at this time is operating on such a narrow margin of dollars, of coal, of food and of raw materials that it is most vulnerable to the communist attacks.

Majority Opposes Strikes — Communist tactics have been to get a minority of the workers to approve strike action by a show of hands, and any objectors have been labeled strike-breakers. These tactics, although meeting with some success, have been denounced by anti-communists, who demand the right to work and government guarantee of secret voting in factory polls. The non-communist wing of the CGT and the Christian Federation of Labor issued manifestoes urging their members to insist upon the secret ballot, and such elections have generally repudiated communist leadership.

The situation became so serious France's President, Vincent Auriol, called for a government of public safety and an end to all strikes. "I know, of course, that the right to strike is incorporated in our constitution," he declared, "but the right to work is also constitutional . . . Misery, hunger and suffering are not constitutional. That is why I would like all workers in the name of the Republic . . . to understand that they must go back to work."

Emergency Powers Granted — Under the leadership of Robert Schuman, recently elected premier, a government of socialists, Christian Democrats and members of the Center parties was formed which asked for and got extraordinary powers to cope with sabotage and to assure the free right to work.

These powers are as follows:

1. Mobilization of 80,000 army reservists to reinforce police strength;
2. Imprisonment and fines for anyone guilty of depriving workers of their right to work;
3. Double penalties for armed violence or sabotage against non-striking workers;
4. Heavy penalties for obstructing the right to work;
5. Immediate dismissal of any state employee found guilty of being involved in any of the forbidden acts.

When strikes spread over France early this month, two million people were involved, but the number has since been reduced to less than one million, mostly miners, longshoremen and sailors.

In the most crucial stage of the strikes, railroad sabotage, clashes between strikers and police and occupation of public buildings by strike sympathizers were common, particularly in the southern cities of Marseilles, Nice, Beziers, Valance and Arles. The act of sabotage at Arras, where 20 people were killed, however, had a profound effect on the French and weakened communists' strength.

It would be wrong to assume from the government's victory over the communists both in the legislature and in the street fighting that the fight is one between employers and employees or between the nation and organized labor. Actually the cause of the violence is the fight between rival factions of labor, both of whom are struggling in different ways for higher living standards, and in the case of the communist minority, for chaos until the country turns communistic.

Interim Raise Offered—At present the rank and file of the CGT is looking in two directions: 1—for new leadership; and 2—for government guarantees that it will get living wages. The government has offered a 1500 franc ($12.50) monthly bonus to offset inflationary prices. This offer is an interim emergency arrangement to hold the wage-price problem until the government, trade unions and employers' organizations can consult on a general economic plan to balance wages and prices until June 1, 1948.

BRITISH INGOT OUTPUT DECLINES IN NOVEMBER

BRITISH steel production in November was at an annual rate of 14,174,000 tons compared with 14,316,000 tons a year in October and 13,715,000 tons in November, 1946, British Iron & Steel Federation announces. Pig iron production showed an increase to an annual rate of 8,617,000 tons compared with 8,352,000 tons in October and 8,002,000 tons a year ago. Details of production rates are shown below.

STEEL INGOTS AND CASTINGS

	1946		1947	
	Weekly Average	Annual Rate	Weekly Average	Annual Rate
1st Quarter	242,600	12,617,000	216,000	11,231,000
2nd Quarter	252,100	13,111,000	244,100	12,694,000
3rd Quarter	230,000	11,953,000	235,400	12,241,000
October	254,300	13,226,000	275,300	14,316,000
November	263,800	13,715,000	272,600	14,174,000

PIG IRON

	1946		1947	
	Weekly Average	Annual Rate	Weekly Average	Annual Rate
1st Quarter	145,000	7,566,000	134,400	6,989,000
2nd Quarter	150,500	7,827,000	141,600	7,363,000
3rd Quarter	146,600	7,622,000	146,700	7,628,000
October	155,800	8,102,000	160,600	8,352,000
November	153,900	8,002,000	165,900	8,617,000

Components Makers See 1948 as Ga

Production expected to equal that of 1947, prices to rise slightly with more substantial increase if labor gains third round of wage boosts, and demand continues at high levels

By JOHN S. MORGAN
Assistant Editor, STEEL

CONSENSUS among many informed authorities connected with the machine components field is that 1948's production will be at the 1947 level, that component prices may rise slightly and will certainly increase if wages rise, that delivery dates will continue to show improvement over last June (STEEL, June 23, p. 69), and that order backlogs will remain at high levels even though the tapering trend begun earlier this year will continue through the next 12 months.

Experience of most component manufacturers is consistent in regard to steel supply. The larger firms are finding the situation easier, while with the smaller companies steel is as tight or tighter than ever.

Although numerous instances of expansion are reported in the industry, general production increases are not expected to be significant because much of the construction is for laboratories and offices or for operational facilities to replace production maintained in makeshift, war-engendered or otherwise inadequate quarters.

The general trend in the components industry is also toward more research. Not only is there more money being spent on research and development, but the per cent of income devoted to this aspect of business also has been increased. In many instances this is up 50 per cent. The dollar amount for such expenditures has in some cases tripled since 1939.

All manufacturers of components who were contacted were unanimous in the opinion that the possibility of strikes and the uncertainties concerning the European relief requirements are imponderables that may turn all estimates topsy-turvy.

Trend toward more size diversification in springs is expected to continue in 1948. *Shown at left is a foreman checking outgoing orders at the Pittsburgh spring works of Crucible Steel Co. of America*

Bearings, Bushings and Couplings—The makers of bearings, bushings and couplings believe that conditions in 1948 will conform generally to the broad components picture, but they are a trifle gloomy about the dollar volume production possibilities for 1948. Export demand fell sharply in the latter part of 1947 because of dollar difficulties abroad, and as yet, with European relief requirements only roughly indicated, the export possibilities for bearings and related products are not known.

In the survey conducted by STEEL last June, 34 per cent of the plants using bearings reported they could get delivery in less than 60 days, while 66 per cent of the plants had to wait over 60 days, depending on the type of bearing used. This has improved to about a 40-60 per cent ratio, with more companies reporting that they can get delivery from stock. Many special items, however, still require six to 12 months for delivery.

The dollar volume of bearing production was up about 15 per cent in 1947 over 1946, and up 220 per cent in dollar volume in 1947 over 1939. Freedom from strikes in 1947 accounts in large measure for the improved performance over 1946. Expansion during and since the war accounts for the increased current output as compared with 1939. Even taking into account the inflated dollar, the postwar production increase is tremendous. Most of the bearing manufacturers are devoting about the same proportion of their earnings to research, but the increase in dollars is large, compared with prewar totals. Price increases in this section of the components industry are not generally expected unless labor goes up. From only one quarter came the report of a proposed price boost regardless of what happens on the labor front.

Valves, Cylinders and Pumps—In the valve, cylinder and pump field, general opinion is that about an 8

s Good Year

per cent increase in business for 1948 can be expected, as compared with 1947. Dollar volume of business in this area during 1947 showed a 20 per cent increase over 1946 and a 166 per cent rise over 1939. Whereas only 12 per cent of the cylinder makers could report delivery dates of under 60 days as of last summer, this situation has improved considerably now with about 20 per cent quoting dates of less than 60 days on many types of their products. The general steel supply situation, in which large producers are having less trouble and smaller firms as much or more, is clearly borne out here. One small firm expects it will soon be forced to shut down for a short time as it is operating on a hand-to-mouth basis. Nevertheless, the majority of companies reporting indicate that the supply is a little better. Expansion plans for 1948 are unusually active in this segment of the components industry. Several major construction projects are now in progress or are contemplated. Expansion since the war's end has accounted for increases in individual company output ranging from 25 to 50 per cent.

The increased proportion of earnings in this field now devoted to research as compared with 1939 is significant, and the trend conforms to the general pattern. Individual companies report percentage increases in their research allotment range from 10 to 500 per cent as compared with prewar standards. The average increase is 86 per cent. In the matter of price increases, several companies report that such action will be essential regardless of what happens on the labor front.

Gears—In the gear field it appears that the 1947 dollar volume output will be about 50 per cent above that of 1946. By the same token, the increase in 1947 over 1939 is roughly 175 per cent. According to Newbold C. Goin, executive secretary of the American Gear Manufacturers Association, this is not out of line when one "takes into consideration that in 1946 we had a good many strikes of quite long duration, severe material shortages throughout the year, as well as governmental restrictions not entirely lifted." The difference between 1939 and 1947, he adds, is accounted for by quite a material increase in capacity as well as the number of companies in the industry.

In regard to prospects for 1948, the consensus is that it will be about the same as in 1947, although one observer predicts a 25 per cent drop in dollar volume.

Delivery dates in this area of the machine components industry vary widely since there are so many different kinds of gears. The STEEL survey on this subject last June gave figures indicating that 42 per cent of the gear users could get delivery in less than 60 days, while 58 per cent had to wait more than 60 days. Current situation appears to be about the same. In the matter of price increases, gear manufacturers generally believe that there will be no boosts unless wages go up. Prices on cataloged gearing products increased about 22 per cent in 1947.

No further expansion in the gearing industry is expected for some little time to come. The expansion made during and since the war has already more than doubled the product capacity which is now considered adequate to meet normal demands. In the matter of research, greatest activity occurs with companies seeking to develop new product lines. Here both the percentage of earnings and the total amount of money involved has increased considerably. There is little change, however, in the totals allotted since 1939 for pure research.

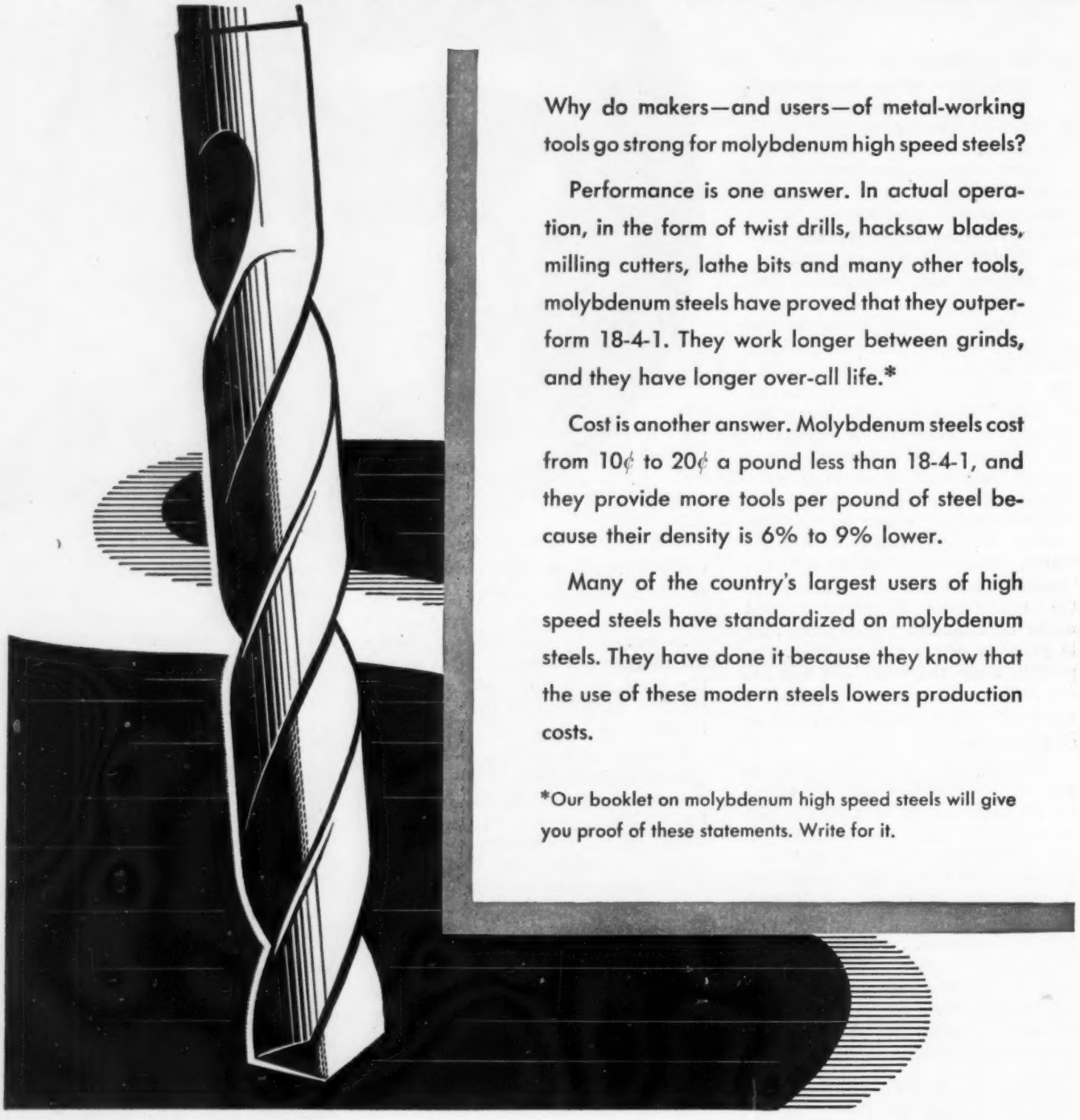
With demand for anti-friction bearings up two to five times above prewar levels, manufacturers predict good prospects for 1948. Scene above shows workers at SKF Industries Inc. assembling huge spherical roller bearings for a Wisconsin paper mill

V-belts, Pulleys, Chains and Clutches—Manufacturers of v-belts, pulleys, chains and clutches believe that their prospects for 1948 may be just a trifle under 1947's production level. According to STEEL'S recent summary on delivery dates, 74 per cent of the users of these products were obtaining delivery in less than 60 days. The situation remains the same and is considered normal by the manufacturers. Price increases are expected in some quarters over and above any increases that might be caused by a boost in the price of labor. In other respects, this area conforms closely with the general pattern for the machine components industry.

Bolts, Nuts, Rivets and Screws—In the bolt, nut, rivet and screw industry, 1947 was a banner year with dollar volume increasing about 40 per cent over 1946 and about 250 per cent over 1939. With the 1947-46 comparison, strikes spell the main reason for the change, as with the components industry as a whole. Prospects for 1948 are also bright with estimates pointing to about a 5

(*Please turn to Page* 110)

WHY THE TREND IS TO Mo HIGH SPEED STEELS



Why do makers—and users—of metal-working tools go strong for molybdenum high speed steels?

Performance is one answer. In actual operation, in the form of twist drills, hacksaw blades, milling cutters, lathe bits and many other tools, molybdenum steels have proved that they outperform 18-4-1. They work longer between grinds, and they have longer over-all life.*

Cost is another answer. Molybdenum steels cost from 10¢ to 20¢ a pound less than 18-4-1, and they provide more tools per pound of steel because their density is 6% to 9% lower.

Many of the country's largest users of high speed steels have standardized on molybdenum steels. They have done it because they know that the use of these modern steels lowers production costs.

*Our booklet on molybdenum high speed steels will give you proof of these statements. Write for it.

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CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

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MOLY

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Purchase of steel facilities by automakers to insure flat-rolled supply holds interest in motor capital. Packard reported considering deal to get more steel in 1948

DETROIT

AT SOME distant date when the boys in the back room look back on the days of 1946-48 in the steel and auto industries, there is going to be a lot of tall talk about motor companies buying up small steel plants in the effort to bolster their supplies of sheet and strip. The Studebaker-Empire, Hudson-Shenango, Kaiser-Frazer-Portsmouth and other tieups yet to come are providing and will continue to furnish some of the choicest bits of gossip in the trade. There are innumerable personalities involved, old relationships broken up, and disgruntled stockholders muttering in their beards.

Just how much all these deals will help in the overall steel supply for automotive plants is a question yet to be answered. It is one thing to plank down some cash for a plant, and another thing to see any bundles of sheets coming into the shipping room. Nevertheless, the motor companies seem convinced the only way to get more steel is to buy up a steel plant. George Christopher, president of Packard, is the latest to hint a move in this direction. He said the other night that at long last Packard will have its steel supply "buttoned up" in 1948 and that while other problems might be encountered next year, they would not relate to steel. No disclosure of just what he meant by this statement was made, but it could be either purchase of a steel plant or a step-up in a scrap-ingot-sheet conversion arrangement.

Expects 50 Per Cent Increase — Packard will build about 60,000 cars this year, far short of plant capacity and contemplated schedules. Next year it is expected a 50 per cent improvement may be possible. Christopher further stated he would take his share of the blame for not investigating further propositions offered to the company a year or more ago which might have increased steel supplies but which at the time sounded fantastic. There is some opinion around Detroit to the effect that Briggs Mfg. Co. might have done a little more toward assuring Packard a better steel supply, since it had the full Packard body business, and with the weight its steel buyers carry in the trade might have pulled a few more strings to obtain steel. That may well be, but is beside the point now since Packard simply did not get the steel.

Hudson Motor Car Co. is expected to have difficulty in hiring 1500 hand sheet mill workers to man the old Shenango tin mill plant at New Castle, Pa., two-thirds of which it recently leased from War Assets Administration.

Years ago most hand sheet mill workers lost out to the strip mills. Many who have experience are now overage or have taken other kinds of employment.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1947†	1946†
January	366,205	109,910
February	393,636	101,637
March	443,588	134,071
April	445,137	229,867
May	404,191	263,445
June	421,466	217,943
July	400,944	315,963
August	364,478	358,457
September	444,501	339,774
October	461,536	406,561
November	418,368*	389,645
December		393,223
12 mos.		3,260,496

* Preliminary.
† All monthly totals revised to conform with statistics of Automobile Manufacturers Association.

Estimates for week ended:

Dec. 6	110,759	93,907
Dec. 13	117,902	96,887
Dec. 20	120,001	96,754
Dec. 27	80,000	67,070

Estimates by Ward's Automotive Reports

Tool, Die Shops Loaded

Tool and die shops in the Detroit area are loaded down with work at the moment, a change in the situation from a few months ago. Bookings are fairly solid until April of next year. The bulk of the activity is automotive, and the inference is that a considerable amount of Chrysler work has been placed. Chrysler divisions have been the enigmas as far as new model preparations are concerned, and the current uptrend is significant, pointing to important changes in the Chrysler line by summer or early fall.

A good share of the tool and die work now in process involves changes in dies for Lincoln and Mercury models, stampings for which were originally scheduled to be produced in Philadelphia and now have been switched to Detroit. Murray Corp. of America is understood to have been assigned this work and many changes were necessary in the dies for Lincoln-Mercury stampings to accommodate them to Murray presses. This is one reason for the delay in the overall Ford new model program which has been deferred at least three times. The costs involved in the switch may easily be conjectured. The further report is heard of extensive warehousing of sheet and strip around Detroit, earmarked for eventual shipment to Murray for Ford stampings.

Studebaker reportedly is combing the Detroit area for tool and die time, apparently having decided to transfer its tooling work from Philadelphia to this vicinity. Presumably any major changes in the Studebaker lines would appear next fall, since the 1948 models already have been introduced.

Packard Honors Oldtimers

A third-generation employee was among 403 honored last week on completion of ten years' association with Packard in presentation ceremonies inaugurated 30 years ago. Past and present membership in the Packard senior league, to which all employees with ten or more years of service belong, now totals nearly 11,000, half of whom are still in the company's employ.

260,000 Trucks Exported

Export shipments of trucks this year will amount to around 260,000 units, or 21 per cent of the total production of the truck industry. This continued the reversal of the prewar pattern when more passenger cars than trucks were exported, much

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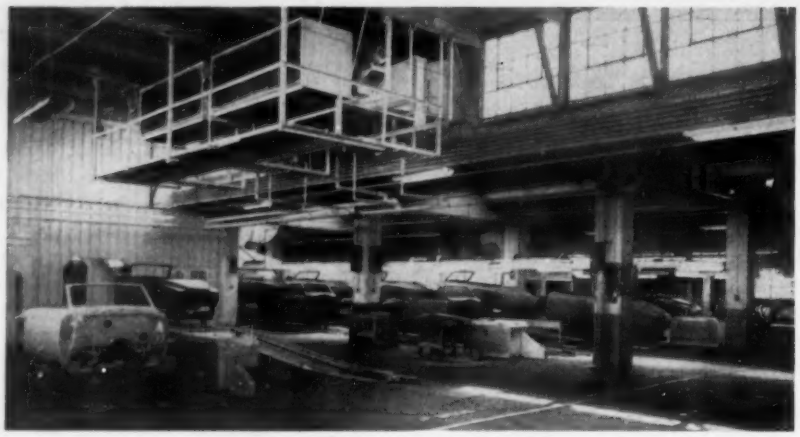


CONVERTIBLE CAPACITY ENLARGED: Studebaker has placed in operation new shops for the exclusive manufacture of 1948 convertible bodies. A feature of the unit is the extreme compactness of the facilities as illustrated above. This area contains 11 parallel conveyor lines. Bodies start in white at far right and move progressively back and forth through bonderite processes, ovens, sanding stations and paint spray booths until they emerge at left in finished condition

of the credit of course going to Willys-Overland which is sending approximately 25 per cent of its total production out of the country. Without exception in the years prior to 1941, the number of passenger cars shipped abroad exceeded the number of trucks exported. A recent survey has showed a decided shift in U. S. exports has taken place since the war. Latin American countries rather than European and Far Eastern countries are the leading importers of U. S. cars and trucks. In the truck field, for example, Argentina, Brazil, Mexico and Venezuela are today's top importers as compared with India, Belgium, Hong Kong and South Africa in 1939.

Canada No. 1 Buyer

During 1947, Canada took over the number one spot from South Africa in the imports of American passenger cars. These two countries were followed closely by Argentina, Brazil and Mexico. In contrast to the few cars exported by American manufacturers, Great Britain exports six of every ten cars produced, while France sends nine of every ten cars built out of the country.

Auto Taxes $3 Billion

Another new record will be posted this year when special motor vehicle tax collections by federal, state and local governments reach nearly $3 billion. At that rate, the owners of the nation's 37 million motor vehicles are paying nearly $6000 a minute in special taxes. The federal government took $1039 million of the total, with excise levies on purchases of new cars and trucks, gasoline and oil, tires and tubes and parts and accessories. State registration fees amounted to $602 million, while the largest single source of tax revenue from motorists came in state gasoline taxes which totaled $1178 million. Municipal and county governments also had their share of the motorist's tax dollar, with levies totaling $15 million, while highway and bridge tolls added another $80 million. Total motorist taxes in 1947 will represent an increase of 35 per cent above prewar levels, and more than 15 per cent above 1946.

Olds To Unveil "Futuramic"

As of Dec. 15, Oldsmobile had completed 101,970 cars of the 1947 model, and approximately 7000 more were scheduled for the last half of the month. About 5700 more will be built in January prior to the changeover Jan. 15, giving the division a total of 195,000 for the model year, as against 119,328 in the 1946 model year. Production capacity is now available to build considerably beyond the 1941 peak which was 270,000 units. Olds' golden anniversary model, to be unveiled in January, is a completely restyled version of the current 98 series and has been given the name "Futuramic."

New Car Registrations

Analysis of new passenger car registration figures for the first ten months of the year, as compiled by R. L. Polk & Co., compared with production estimates for 20 manufacturers, discloses some interesting relationships. Expressed in percentages, the list is headed by Dodge at 94.3 per cent of production registered, and descends through Chevrolet, Olds, Pontiac, Nash, Cadillac, Hudson, Plymouth, Buick, Ford, Packard, Chrysler, Mercury, DeSoto, Studebaker, Lincoln, Crosley, Kaiser, Willys and Frazer. The last shows a percentage of 67.3. Difference between registrations and production is represented by exports, cars in dealers' hands, those enroute from manufacturer to dealer and the cars which state registration offices have not yet reported.

Electrician's Idea Pays

An electrician leader in the rolling mill at Ford was awarded a substantial cash bonus for suggestion which added 137 furnace-hours in the annealing department. There are 38 bell annealing furnaces in the division and five or six of them have to be cooled down each month for repairs. Formerly it required 32 hours for each furnace to cool down enough so that a man could work on it. The suggestion was made that holes be cut in the floor of the balcony on which the furnaces are located for cooling, and that blowers be installed to force air through them to speed up cooling. The idea was adopted and cooling time was reduced to 6 hours and 40 minutes, or a reduction of 25 hours on the cooling time of each down furnace.

White Collar Workers Rewarded

Kaiser-Frazer will pay an equitable matching fund of $97,776 to approximately 1200 secretaries, executives and other personnel not sharing in the 1947 security trust fund of $650,889 which has been distributed to 9016 UAW-CIO members under the company's union agreement. Average bonus payment will be $72.16, although some checks run as high as $92. The Willow Run plant now has a total of 16,168 employees.

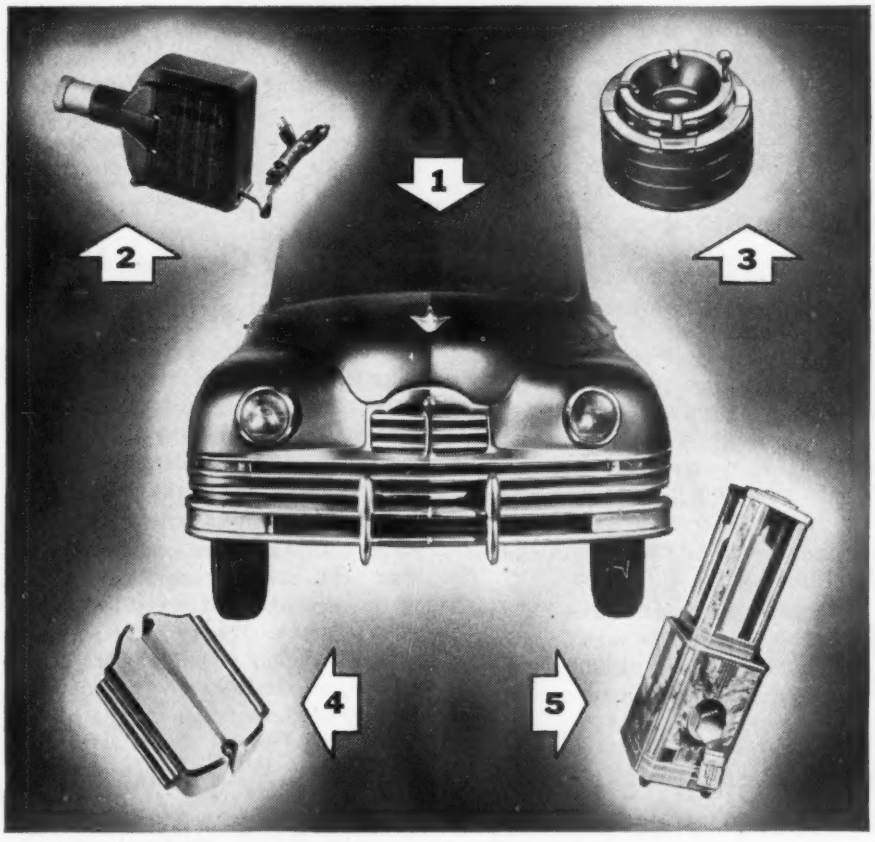
Buick Completes Expansion

Buick has completed its extensive postwar expansion and modernization program, involving 17 new buildings and more than 2,000,000 square feet of new floor space for manufacturing, assembly, foundry, forge and shipping operations. Balanced and integrated facilities are now ready for production of better than 500,000 cars a year.

Why ARE ZINC DIE CASTINGS THE MOST WIDELY USED?

FINISHABILITY *for one thing*

Zinc is the only commonly used die casting metal which can be easily and economically finished by almost any known type of commercial finishing process. Aside from the adaptability of the metal to both electrodeposited and organic coatings, the as-cast surfaces and precise detail of zinc die castings require an absolute minimum of preparation for finishing. Finishability is just one of the many reasons why zinc has for many years been the most widely used die casting metal.



Pictured here are a number of current product designs utilizing ZINC die castings finished in a variety of ways:

1. **CHROMIUM PLATE**
   All of the chromium plated parts on the front end of this car (with the exception of the bumper) are zinc die castings.

2. **WRINKLE ENAMEL**
   The entire housing of this slide projector is composed of just two zinc die castings, attractively finished with a black wrinkle enamel.

3. **PLATE AND ENAMEL**
   The designers of this efficient ash receiver have achieved an interesting effect by finishing the zinc die cast receptacle with a baked enamel to contrast with the plated top castings.

4. **SATIN BRASS PLATE**
   This gracefully shaped door chime housing is a one-piece zinc die casting finished in a handsome satin brass plate, with polished edges for contrast.

5. **DECALCOMANIA**
   A photo-lithographic film coating has been applied to the zinc die cast surfaces of this peanut vending machine to create a marble effect. Molded plastic coatings are also frequently used on zinc die castings.

Ask your die casting source for our booklet "The Finishing of Zinc Alloy Die Castings"—or write directly to us.

You probably know the zinc die casting alloys by the trade name, Zamak. The New Jersey Zinc Company developed alloys of specific compositions for the die casting industry and gave them this name. Zinc alloys of these compositions are the only ones used for die casting. Your die caster exercises careful control in the formulation of these alloys to assure maximum mechanical properties and dimensional stability.

ZINC
FOR DIE CASTING ALLOYS

THE NEW JERSEY ZINC COMPANY, 160 Front St., New York 7, N. Y.

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

Yale & Towne Opens Branch In New York

PHILADELPHIA Division of Yale & Towne Mfg. Co. has established a metropolitan branch at 205 East 43rd Street, New York City, to include a showroom, repair shops to provide preventive maintenance service, a spare parts depot and related facilities.

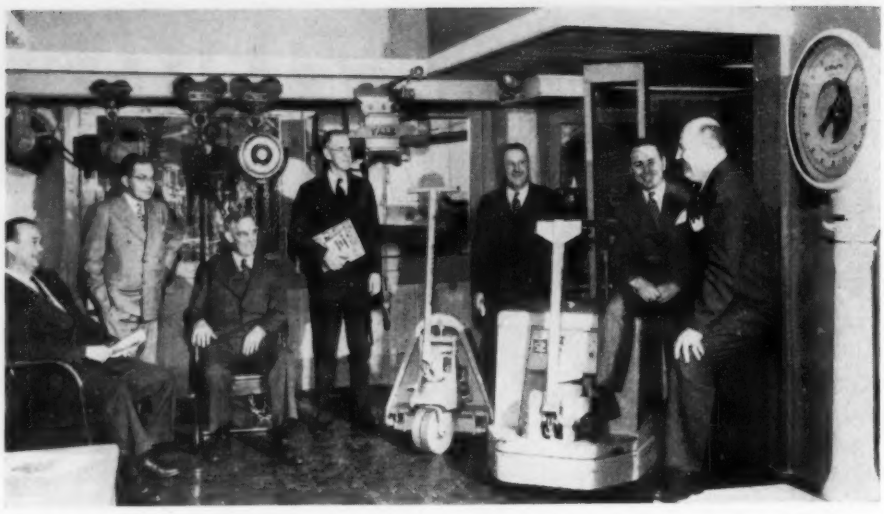
Former sales quarters of Yale & Towne in New York have been moved from the Chrysler Building to the new address.

Contains Studio — In addition to showrooms, service shops and spare parts depot, the new facilities will contain a materials handling library, motion picture studio for showing materials handling films and conference rooms. The export department also will have its headquarters there.

Samuel W. Gibb, general sales manager, pointed out recently that the Philadelphia Division is establishing comparably equipped branches in other major cities and that its expansion of localized services is integrated with the construction in Philadelphia of the company's new 17-acre factory and office building.

Appointments Announced—In connection with the establishment of the New York branch, the following appointments have been announced: Carl E. Lang, regional manager; Robert J. McGreevy, regional sales manager; Charles K. Drury, metropolitan manager; Warren E. Clapp, district manager of hoist sales for New York and Connecticut; and William F. Redmond, district sales manager for hoist sales in upstate New York, northern New Jersey and New England except Connecticut.

Walter F. Randall, the Philadelphia Division's associate director of field activities in charge of New York, New England and New Jersey area, will also be located in the New York branch building. Edward Purchess, who had more than 30 years' experience servicing Kron industrial sales in New York and New England, will be manager of Yale & Towne material handling service department.



Yale & Towne materials handling men discuss company's new metropolitan branch in New York. Left to right: Carl E. Lang, Warren E. Clapp, Walter F. Randall, Charles K. Drury, Walter L. Burghardt, Frank C. Emmick and Robert J. McGreevy

Files Trust Suit Against Abrasive Manufacturers

Department of Justice has filed a civil antitrust suit charging the Abrasive Grain Association and five member corporations with fixing prices for artificial abrasive substances in violation of the Sherman Antitrust Law.

The defendants are: Abrasive Grain Association, Worcester, Mass.; Norton Co., Worcester, Mass.; Carborundum Co., Niagara Falls, N. Y.; American Abrasive Co., Westfield, Mass.; Exolon Co., Tonawanda, N. Y.; and General Abrasive Co. Inc., Niagara Falls, N. Y. Five other members of the association are named as co-conspirators but not as defendants. They are Washington Mills Abrasive Co., North Grafton, Mass.; Abrasive Products Co., Landsdowne, Pa.; John W. Higman Co., New York; Wisconsin Abrasive Co., Milwaukee; and Simonds Abrasive Co., Philadelphia.

The defendant manufacturers and alleged co-conspirators make approximately 98 per cent of all artificial grain manufactured in the United States.

Detroit Steel To Begin California Plant Addition

Ground will be broken soon for a $150,000 addition to the Emeryville, Calif., plant of Detroit Steel Products Co. The addition will increase floor space by 21,600 sq ft and step up present manufacturing and warehousing facilities by about 40 per cent, it has been announced by Sherman M. Hathaway, manager of Pacific Coast Division of Detroit Steel Products.

The Emeryville property now embraces two and a half acres. The building addition is the third increase since the plant was started in 1923. Size was doubled in 1924, and another addition was made in 1926. The present expansion is to enlarge manufacturing facilities for steel residential casements and industrial windows, and provide warehouse facilities for these windows, fire doors and metal building panels.

Atlas Tool Changes Name To Atlas Chain & Mfg. Co.

Atlas Tool & Designing Co., Philadelphia, has changed its charter to Atlas Chain & Mfg. Co. and will concentrate its engineering and designing facilities on the manufacture and application of roller chain drives.

Atlas announces that its chain meets all American standard chain specifications. The company has set up an arrangement whereby its engineers and designers will co-operate with equipment manufacturers in the solution of chain drive problems pertaining to their equipment.

J & L Pays $8 Million in Wage Rate Adjustments

Approximately $8 million was paid to Jones & Laughlin Steel Corp. production and maintenance employees last week as an adjustment of wage rate inequities.

Payments were in accordance with an order of National War Labor Board, dated Nov. 25, 1944, which directed that "the company and the union shall negotiate the elimination of existing intra-plant wage rate inequities, and reduction in the number of job classifications" at Pittsburgh, Aliquippa, Otis and McKeesport works.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Superior Steel Corp., Pittsburgh, held open house last week at its Carnegie, Pa., plant which was attended by 5650. The occasion was Superior's celebration of its 55th anniversary.

—o—

National Industrial Conference Board, New York, reports that in a survey it recently conducted in 455 companies 76 per cent of all workers employed in these companies are protected with disability benefits through group insurance and paid sick leave.

—o—

Bureau of Mines reports that its *Guide for Reducing Fuel Consumption in Commercial Plants* may be obtained from the Superintendent of Documents, Government Printing Office, Washington, for 50 cents.

—o—

Acheson Colloids Corp., Port Huron, Mich., maker of colloidal dispersions, has placed in operation new manufacturing and laboratory facilities in Port Huron. These are the latest additions in a long-range expansion program.

—o—

E. W. Bliss Co., Detroit, manufacturer of metal stamping presses, has transferred its Cleveland office to its manufacturing plant on E. 222nd St., Euclid, O.

—o—

Minster Machine Co., Minster, O., maker of power presses, has named Luther & Pedersen Inc., Chicago, as its exclusive representative in the Chicago and Milwaukee territories.

—o—

H. K. Ferguson Co., Cleveland, industrial engineering firm, will distribute to its employees a bonus of $225,000 following the most successful year in the company's 29 years of operation. The bonus is the largest ever awarded by the company.

—o—

Babcock & Wilcox Co., New York, reports that it is building a high pressure test vessel for the Navy's Underwater Sound Reference Laboratory, Orlando, Fla.

—o—

Robertshaw-Fulton Controls Co. has been formed as the result of the merger of Robertshaw Thermostat Co., Youngwood, Pa., Fulton Sylphon Co., Knoxville, Tenn., and Bridgeport Thermostat Co., Bridgeport, Conn. John A. Robertshaw is president of the new organization which has plants at Youngwood, Knoxville, Bridgeport, St. Louis and Lynwood, Calif. Company produces bellows, bellows devices, thermostats, temperature controls and industrial process controls.

—o—

Society of the Plastics Industry, New York, reports that the industry hopes to produce in 1948 1500 million pounds of plastics and to expand its facilities at a cost of at least $175 million.

—o—

Chase Aircraft Co., Trenton, N. J., has produced the Air Force's first all-metal cargo glider, the Chase XCG-18A.

—o—

Hagan Corp., Pittsburgh, combustion and chemical engineering firm, will hold a conference in Pittsburgh Jan. 10-14 of its district engineers. Purpose will be to confer on the Ring-Balance line of industrial meters acquired with Hagan's purchase, last March, of Ring-Balance Instrument Co., Chicago.

—o—

Olin Gas Engine Co. has moved to 9 Lafayette Ave., Buffalo. Firm does general machine work and produces special machinery and mechanical equipment.

—o—

E. I. du Pont de Nemours Co., Wilmington, Del., reports that its Electrochemicals Division is now operating a new automotive fuel testing laboratory in El Monte, Calif.

—o—

Firan Co., manufacturer of infrared electric heaters, has moved to 1735 Berkeley St., Santa Monica, Calif.

—o—

Ohio Electric Mfg. Co., Cleveland, now has a daily output of 1200 electric motors, an all-time high. Company produces small motors for applications on oil burners, machine tools and elevator control equipment.

—o—

Excel Metals Co., producer of linotype metals, has moved to 3520 E. 24th St., Los Angeles.

—o—

War Assets Administration has merged its General Review and Real Property Review Boards into a General Board which will review and make recommendation regarding contracts, controversies and large sales; analyze real property disposal cases in terms of the Surplus Property Act, business practices and the best interests of the government; and conduct hearings and investigations on controversial and unusual cases.

—o—

University of Chicago announces that Westinghouse Electric Corp., and Aluminum Co. of America have joined with Standard Oil Co. of Indiana, Standard Oil Development Co. of New Jersey, Shell Oil Co. and Sun Oil Co., in helping to finance a $12 million atomic research program.

—o—

Cuyahoga Valley Railway, serving the Cleveland Otis works of Jones & Laughlin Steel Corp., is the winner in the railroad group, competing in the 17th Annual Greater Industrial Safety Campaign, which closed Sept. 30.

—o—

Armstrong Bros. Tool Co., maker of tool holders, pipe tools and machine shop specialties, has moved to 5200 W. Armstrong Ave., Chicago.

—o—

Public Roads Administration reports that motor vehicle registration in 1947 is an estimated 37,164,000, surpassing last year's registrations by more than 3,218,000 and exceeding 1941 registrations, the prewar peak, by some 2,690,000.

—o—

LaBelle Industries, Oconomowoc, Wis., manufacturer of hardware, expects to be completely moved into its new factory on Fifth St. by the first of the year.

—o—

United States Rubber Co., New York, predicts that many homes of the future will be wired with aluminum instead of copper wire.

—o—

Allis-Chalmers Mfg. Co., Milwaukee, is beginning a drive to hire 1540 more men and women to build night shifts at its West Allis, Wis., works. Firm's General Machinery Division has an order backlog of $166 million.

—o—

Majestic Mfg. Co., St. Louis, maker of cooking apparatus, has moved its general office and plant to 4550 Gustine Ave., St. Louis.

—o—

Progressive Welder Co., Detroit, manufacturer of resistance welding equipment, has named Hunt-Jordan Co., Chicago, as its sales representative in northern Illinois and parts of Iowa and Indiana.

—o—

Peerless Pump Division, Los Angeles, Food Machinery Corp., has moved its Canton, O., works to 2005 Northwestern Ave., Indianapolis.

The Business Trend

BOOMING operations in all segments of industry pushed STEEL's index of industrial production up one point in the week ended Dec. 20 to a new postwar high of 172 per cent (preliminary) of the 1936-1939 average. Seasonal influences are affecting in different directions two important general business indicators—freight car loadings are beginning to show the normal declines to be expected as the weather worsens; and electric power output, now at an all-time peak, may push still higher, generating capacity allowing, to meet demands arising from holiday lighting displays, longer store hours and increased home use.

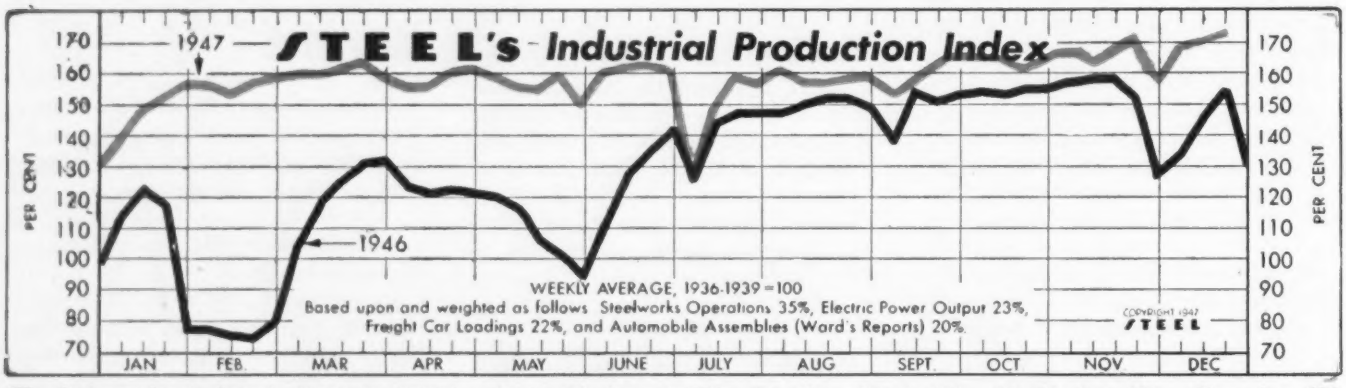
AUTOS—In a spurt to produce as many cars as possible before the Christmas week, the industry in the week ended Dec. 20 turned out 120,001 cars and trucks to establish a new postwar record. The previous high of 117,902 units had been turned out in the preceding week. Overtime work at Chrysler divisions' plants was an important factor in the increased output as were the gains made in truck production by General Motors and Ford.

STEEL—Unchanged for three successive weeks at fractionally over 97.5 per cent of rated capacity, the national steel ingot rate has been the highest achieved since war's end. This rate provides a suitable climax to the highest peacetime year's production in history. The industry, in turning out an estimated 84.7 million tons of steel ingots, has done much toward keeping all other industries operating at near-record rates, and with expectations that 1948 will see steel production maintained at or in excess of the 1947 level, supply-demand balance may be struck.

SALES—Independent retail stores in the aggregate noted an increase in sales in November of 4 per cent over the like month of 1946, Bureau of the Census reports. The durable goods trades accounted for the largest increases, lumber and building materials dealers and motor vehicle dealers, for example, reporting gains of 20 per cent and 14 per cent, respectively, over the previous year.

PRICES—Wholesale prices advanced again in the week ended Dec. 13, the Bureau of Labor Statistics index rising 0.2 per cent to 161.4 per cent of the 1926 average, a new high. Substantial increases were noted for crude petroleum and petroleum products in that week, and somewhat smaller price rises were also recorded for bituminous and anthracite coal and passenger cars. Industrial raw materials and manufactured products were up 0.5 per cent and 0.3 per cent, respectively, over the previous week.

CONSTRUCTION—November expenditures of $1456 million for all types of construction, although 5 per cent under the October figure which set the 1947 record, underwent a less than seasonal decline. Compared with November, 1946, construction activity was up 26 per cent. A new high level of homebuilding and advances in commercial construction during the month were reported by the Bureau of Labor Statistics.



The Index (chart above): Week Ended Dec. 20 (preliminary) 172 Previous Week 171 Month Ago 171 Year Ago 155

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	97.5	97.5	96.5	85
Electric Power Distributed (million kilowatt hours)	5,350‡	5,327	5,180	4,940
Bituminous Coal Production (daily av.—1000 tons)	2,250	2,217	2,100	2,268
Petroleum Production (daily av.—1000 bbl.)	5,260‡	5,253	5,275	4,708
Construction Volume (ENR—Unit $1,000,000)	$130.1	$95.6	$100.9	$86.2
Automobile and Truck Output (Ward's—number units)	120,001	117,902	115,197	96,754

* Dates on request. ‡ Preliminary. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

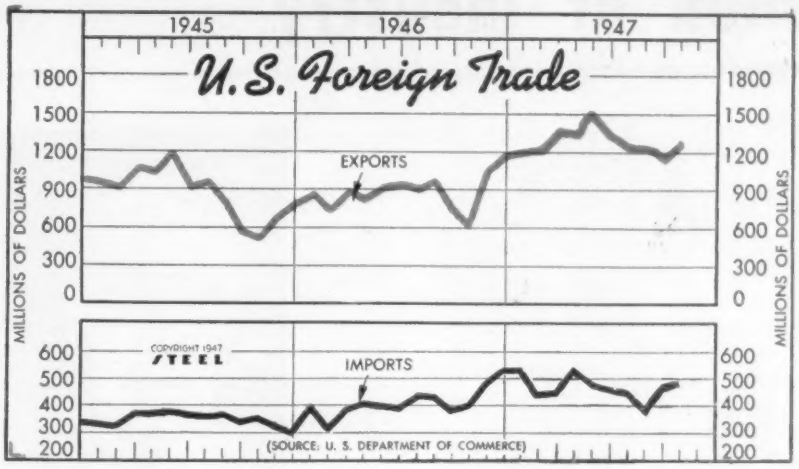
TRADE				
Freight Carloadings (unit—1000 cars)	830†	854	903	836
Business Failures (Dun & Bradstreet, number)	75†	87	79	27
Money in Circulation (in millions of dollars)‡	$28,923	$28,874	$28,595	$29,019
Department Store Sales (change from like wk. a yr. ago)‡	+10%	+7%	+11%	+20%

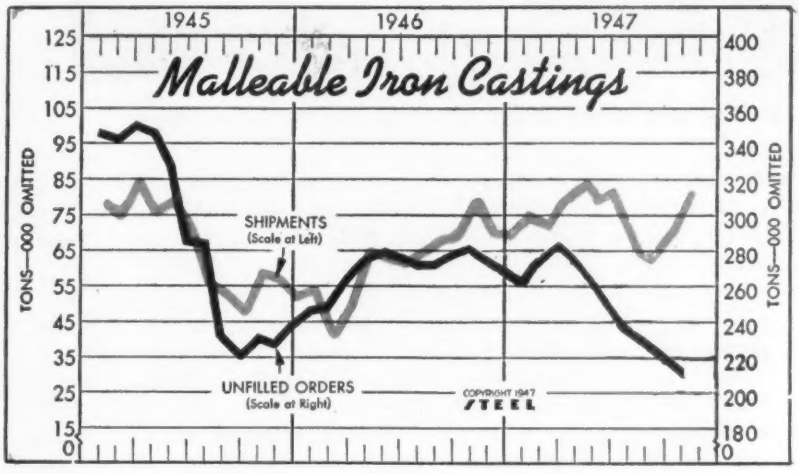
† Preliminary. ‡ Federal Reserve Board.

Foreign Trade

Bureau of Foreign and Domestic Commerce
(Unit Value—$1,000,000)

	Exports			Imports		
	1947	1946	1945	1947	1946	1945
Jan.	1,114	799	903	533	394	334
Feb.	1,151	670	887	435	318	325
Mar.	1,327	815	1,030	444	384	365
Apr.	1,299	757	1,005	512	407	366
May	1,423	851	1,135	474	397	372
June	1,242	878	870	463	386	360
July	1,151	826	893	450	434	356
Aug.	1,143	883	737	400	425	360
Sept.	1,101	643	514	481	378	335
Oct.	1,226	537	455	491	394	344
Nov.	....	986	639	...	482	322
Dec.	....	1,097	736	...	536	297
Total	....	9,742	9,804	...	4,935	4,136



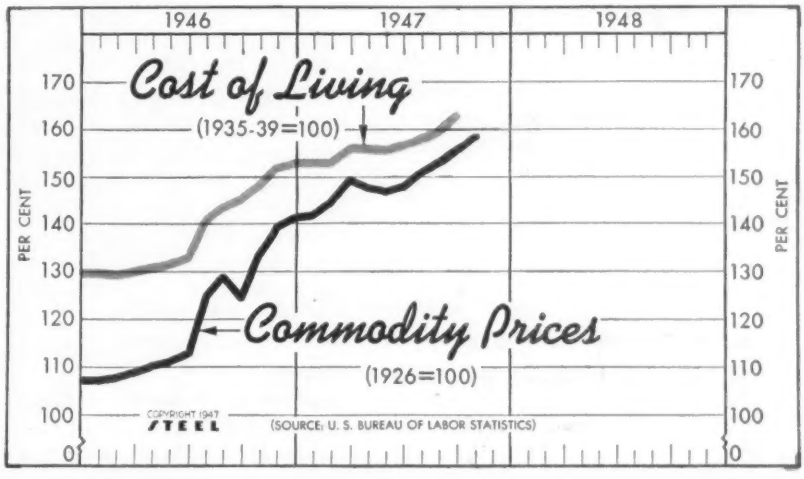


Malleable Iron Castings

	Shipments (000 omitted)		Unfilled orders for castings for sale (000 omitted)	
	1947	1946	1947	1946
Jan.	75.9	54.0	260	246
Feb.	74.7	40.2	274	249
Mar.	76.6	50.2	281	263
Apr.	81.9	65.0	275	268
May	75.5	62.6	262	272
June	78.5	61.6	249	276
July	64.2	64.4	235	272
Aug.	62.4	67.9	230	273
Sept.	71.6	69.5	218	277
Oct.	84.0	79.2	211	281
Nov.	...	69.9	...	278
Dec.	...	68.3	...	268

Wholesale Commodity Price—Cost of Living Indexes

	Commodities (1926=100)			Living Cost (1935-39=100)		
	1947	1946	1945	1947	1946	1945
Jan.	141.5	107.1	104.9	153.3	129.9	127.1
Feb.	144.5	107.7	105.2	153.2	129.6	126.9
Mar.	149.5	108.9	105.3	156.3	130.2	126.8
Apr.	147.7	110.2	105.7	156.2	131.1	127.1
May	147.1	111.0	106.0	156.0	131.7	128.1
June	148.0	112.9	106.1	157.1	133.3	129.0
July	150.8	124.7	105.9	158.4	141.2	129.4
Aug.	153.6	129.1	105.7	160.3	144.1	129.3
Sept.	157.4	124.0	105.2	163.8	145.9	128.9
Oct.	158.5	134.1	105.9	....	148.6	128.9
Nov.	....	139.7	106.8	....	152.2	129.3
Dec.	....	140.9	107.1	....	153.3	129.9
Ave.	....	120.9	105.8	....	139.3	128.4



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$15,543	$13,671	$15,860	$15,872
Federal Gross Debt (billions)	$257.0	$257.7	$258.4	$259.0
Bond Volume, NYSE (millions)	$37.2	$34.2	$25.7	$28.6
Stocks Sales, NYSE (thousands)	6,942	5,911	4,990	6,973
Loans and Investments (billions)†	$65.1	$65.0	$64.9	$57.6
United States Gov't. Obligations Held (millions)†	$37,564	$37,560	$37,834	$37,572

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$76.09	$76.09	$76.09	$64.91
All Commodities†	161.4	161.0	158.5	139.7
Industrial Raw Materials†	180.9	180.0	175.8	154.3
Manufactured Products†	153.7	153.3	151.7	134.8

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

CHARLES H. STEWART

CARL J. BARBEE

C. C. CUMMINGS

Charles H. Stewart has been appointed manager of the Wilson-Snyder Mfg. Division of Oil Well Supply Co., at Braddock, Pa., a subsidiary of U. S. Steel Corp. He succeeds **T. E. Regan,** who has resigned to accept a position with another company. Mr. Stewart has been shop superintendent at the division for the past seven years.

—o—

George N. Vitt has resigned as assistant to the president of A. F. Holden Co., New Haven, Conn., to become the secretary, member of the board of directors and manager of John Ek Industries Inc., Guilford, Conn., manufacturer of heat-treating salt baths, furnaces and automatic installations for various metallurgical processes, and industrial internal combustion engines and precision items.

—o—

Frank M. Sweeny has been appointed district sales agent in Baltimore for Champion Rivet Co., Cleveland. He will handle the sales of rivets and welding electrodes for both the railroads and industrial users in Baltimore, Washington, Richmond and Norfolk. **Lew Gilbert** has been appointed welding electrodes sales representative in the New York area, with headquarters at New York.

—o—

L. J. Gould, assistant chief engineer of construction, Bethlehem Steel Co., Bethlehem, Pa., succeeds **R. B. Gerhardt** as chief engineer of construction. Mr. Gerhardt will retire from that position Jan. 1. He served, prior to the latter position, as assistant general manager at the company's Sparrows Point and Steelton plants. Mr. Gould's successor will be **A. J. Fisher,** fuel engineer at Sparrows Point since 1929. Mr. Fisher has been elected national president of the Association of Iron & Steel Engineers for 1948.

—o—

Carl J. Barbee has been appointed general manager of the Kelvinator Ltd. plant at Crewe, England. He has been patent counsel for Nash Motors Division since 1938, and succeeds **A. E. Carter** in the British post. Mr. Carter remains with the Nash-Kelvinator manufacturing staff.

—o—

Edward L. Mack, associated with Strong, Carlisle & Hammond Co., Cleveland, for the past 12 years, and assistant manager of the Machine Tool Division since 1946, will succeed **George J. Zimmerman** as manager of the division, effective Dec. 31. Mr. Zimmerman, who has also been serving as president of the company since 1940, is resigning that position, his successor to be elected in January. **Stanton C. Gunnett,** assistant manager of the Mac-it Division, succeeds **Harry H. Smith** as manager of the division. Mr. Smith, who started with the organization in 1895, is retiring at the end of the year.

—o—

American Steel & Wire Co., Cleveland, subsidiary of U. S. Steel Corp., has announced appointment of **Walter J. Case** as manager of the electrical, wire rope and construction materials department in the company's district sales office at New York. He has been assistant manager of that department.

—o—

J. W. McCoy has retired as vice president and member of the executive committee of E. I. du Pont de Nemours & Co., Wilmington, Del. He will be succeeded by **William H. Ward.** Mr. McCoy will continue to serve as a director.

—o—

C. C. Cummings has been promoted to parts control manager of the Kent, O., plant of Twin Coach Co. He joined the service department in 1931, and since then has served in the production control and process engineering departments.

—o—

W. A. Neumann Jr. has been appointed factory controller, assistant treasurer and assistant secretary of the De Laval Steam Turbine Co., Trenton, N. J. He succeeds **C. J. Kushell Jr.,** who has resigned. Prior to his association with De Laval a year ago, Mr. Neumann had been with Westinghouse Electric Corp., Pittsburg, for nine years, during which time he served in accounting and administrative capacities.

—o—

Richard F. Sentner has been appointed assistant vice president of sales, United States Steel Corp. of Delaware, effective Jan. 1. He began his business career with the Wheeling Steel Corp. as a salesman in New York in 1926. He later became assistant manager of tin plate sales in 1933, with headquarters in Wheeling, W. Va., and in 1941 became manager of tin plate sales for Wheeling. In 1942 he joined the War Production Board, and later was appointed deputy director of the Steel Division. In 1945 he returned to the Wheeling Steel Corp. as assistant manager of sales.

—o—

Four appointments have been announced for the Control Divisions,

Assembly Costs Slashed 25%

64 SPEED NUTS on each "Electro" Cigarette Vending Machine *Boost* Production and *Reduce* Assembly Costs.

Push-on type SPEED NUTS are used over die cast studs as shown at left, to attach medallion and delivery compartment bezel, and for other fastening jobs not visible in photo. C7000 flat type SPEED NUTS are used to attach hinges to top cover, bottom frame and doors.

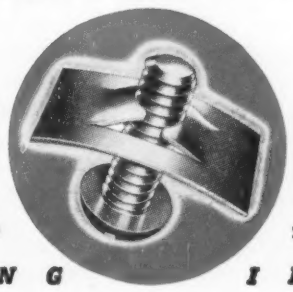
Mr. M. Caruso, President of C-Eight Laboratories, Newark, New Jersey, has this to say about SPEED NUTS:

"Further experiments increased the use of SPEED NUTS in assembling our "Electro" All-Electrical Cigarette Vending Machine. Since this change over, a study of our costs reveals a *saving up to 25%*. We feel sure that more and more Tinnerman fasteners will be used on our equipment and will set a standard of quality and perfection for the ultimate user."

We're sure we can help you produce a better product at lower cost. Write us about your assembly problem today.

TINNERMAN PRODUCTS, INC. • 2039 Fulton Road, Cleveland 13, Ohio

In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario
In England: Simmonds Aeracessories, Ltd., London
In France: Aerocessoires Simmonds, S.A., Paris
In Australia: Simmonds Aerocessories, Pty. Ltd., Melbourne



Speed Nuts*
PATENTED
Trade Mark Reg. U. S. Pat. Off.

MORE THAN 4000 SHAPES AND SIZES

FASTEST THING IN FASTENINGS

recently established by the apparatus department of General Electric Co., Schenectady, N. Y. **K. R. Van Tassel,** recently named manager of the divisions, has named **M. H. Blesh,** manager of manufacturing, **C. B. Bradish,** manager of engineering, and **E. A. Green,** manager of sales. **Thomas I. Hage** has been appointed accountant for the divisions.

—o—

Gen. Donald Armstrong has been elected executive vice president of the United States Pipe & Foundry Co., Burlington, N. J., also a director of the company and a member of the executive committee. He was recently assistant chairman of the executive committee of the American Standards Association. He served in the last war as chief of the Chicago Ordnance District, and was commandant of the Industrial College of Armed Forces. **W. T. Coleman Carpenter,** a member of the board of directors of the U. S. Pipe company since 1902, a member of the executive committee since 1912, and first vice president since 1920, has resigned this latter position, although he still remains as a director and a member of the executive committee. **Frederic S. Jorden** was elected first vice president to succeed Mr. Carpenter. He has been a director and a member of the executive committee for many years, and during the war was executive vice president.

—o—

C. W. Myers has been appointed divisional field engineer in charge of sales and service in Texas, Oklahoma, Arkansas, Louisiana and western Tennessee for Davey Compressor Co., Kent, O.

—o—

Phillips Mfg. Co., Chicago, has appointed **A. Otto Miller** as sales engineer for Indiana. He previously had been associated with Detrex Mfg. Co.

—o—

Officers and directors of Automotive & Aviation Parts Manufacturers Inc., Detroit, for the year 1948, have been announced: President, **John Airey,** King-Seeley Corp. was re-elected; vice president, **Malcolm P. Ferguson,** Bendix Aviation Corp., succeeds **George W. Kennedy,** Kelsey-Hayes Wheel Co.; secretary and treasurer, **Walter F. Rockwell,** Timken-Detroit Axle Co., succeeds **J. L. Myers,** Cleveland Graphite Bronze Co. Directors elected for three-year terms are: **Ralph E. Carpenter,** Dana Corp.; **William C. Dunn,** Ohio Crankshaft Co.; **Malcolm P. Ferguson,** Bendix Aviation Corp.; **Lloyd A. Johnson,** National Motor Bearing Co. Inc.; and **W. D. Robinson,** Briggs Mfg. Co.

—o—

George R. Fink, president, Great Lakes Steel Corp., Detroit, has been presented with the Presidential Certificate of Merit for outstanding service during World War II.

—o—

George D. Branston, until recently vice president, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., will represent the foundry industry on a special mission sponsored by the U. S. Department of Commerce for the purpose of surveying accumulations of government-owned military scrap in Germany, and devising ways and means of expediting its return to this country.

—o—

L. S. Beale, secretary, Wirebound Box Manufacturers Association, has been elected chairman of the manufacturing trade group of the National Industrial Council, an affiliate of the National Association of Manufacturers.

—o—

C. A. Hillstrom has been elected vice president of the Corry - Jamestown Mfg. Corp., Corry, Pa., succeeding the late **Raymond C. Anderson.**

—o—

Le Verne Verzier has joined Lupomatic Industries Inc. in the capacity of director of development.

—o—

E. T. Cuddeback, for the last year sales representative in the Atlanta district office of Allis-Chalmers Mfg. Co., Milwaukee, has been named manager of the company's Tampa, Fla., district office. He succeeds **A. D. Robertson,** resigned.

—o—

J. L. Miller, production superintendent at the Zelienople, Pa., factory of Johns-Manville Corp., New York, has been appointed plant manager to succeed **S. K. Cooper,** resigned.

—o—

A. J. Raitch has been appointed chief engineer of the Centaur Division, Le Roi Co., Milwaukee.

—o—

John F. Belcher has been appointed district manager for the New York sales region of Kaiser-Frazer Sales Corp.

—o—

Thomas C. Bradford has been appointed field technical engineer by Anderson Oil Co., Portland, Conn. He has had 20 years of experience in the industrial oil and tool industry, and has represented the Anderson Oil Co. in the New England area since 1938, during which time he was a member of the American Society of Tool Engineers, and American Society for Metals.

—o—

James E. Merchant has been appointed manager of the Cleveland operations of Columbia Steel & Shafting Co., Edgar T. Ward's Sons Co. Division and Summerill Tubing Co. Division, Pittsburgh. He succeeds **Paul M. Butz,** who has served as manager in Cleveland for the past three years, and will now be in charge of the Detroit office. Mr. Merchant has been with the companies for 11 years, and has been manager at Cincinnati for the past six years.

—o—

H. W. Bartley has been elected director of purchases, National Enameling & Stamping Co., Milwaukee. He succeeds the late **A. R. Curtis.**

—o—

Richard A. Mead has been appointed policy and organization analyst on the administrative planning staff of Willys-Overland Motors Inc., Toledo, O.

—o—

Wilfred Sykes, president, Inland Steel Co., Chicago, has been nominated to succeed himself as president of the Chicago Association of Commerce & Industry in 1948.

—o—

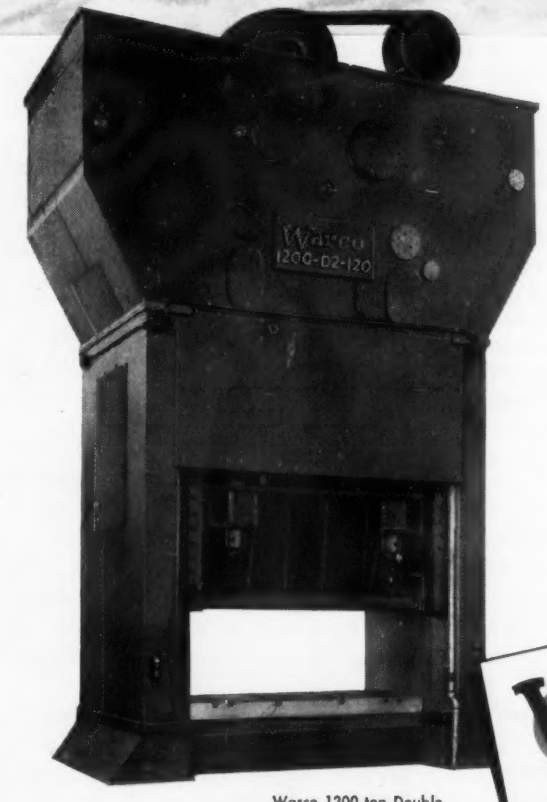
Edward G. Lickteig has been appointed master mechanic of the Detroit Engine Division, Kaiser-Frazer Corp., Willow Run, Mich., to succeed **N. J. Blake,** who has returned to the Kaiser-Frazer plant at Willow Run on special assignment.

—o—

The Detroit Broach Co., Detroit, announces appointment of three new sales representatives. The **G. C. Wood Co.,** 717 Liberty Avenue, Pittsburgh, is now serving southeastern Pennsylvania. In Minneapolis, **William K. Nelson** has been appointed repre-

EDWARD G. LICKTEIG

FAST *Off-Center* WORK DEMANDS EXTRA STRENGTH, EXTRA ACCURACY



Warco 1200-ton Double Action Tie-Rod Press. Bed Area 60"x120"

RUGGED, powerful, accurate . . . Warco presses are built with *extra factors of rigidity* for fast off-center work.

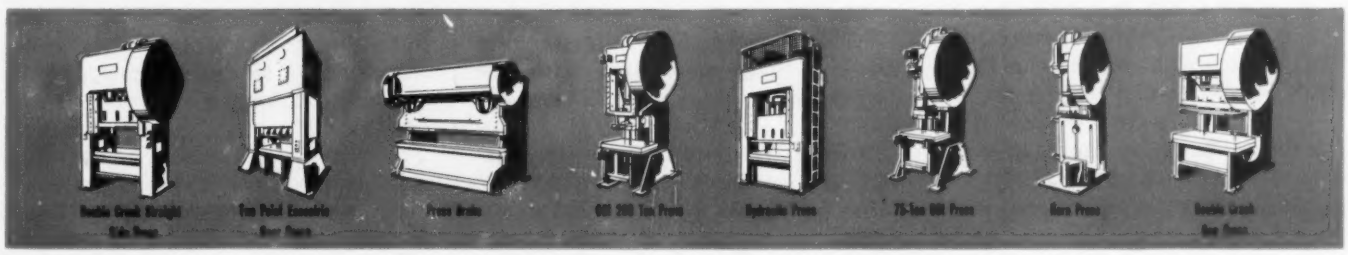
Strong, fully stress-relieved, welded steel construction minimizes frame deformation. Integral box-section columns provide great lateral stiffness . . . prevent shifting of the crown under changing side-thrust loads. The centrally-lubricated gibs are extra long, extra wide . . . give extreme accuracy and long life.

Warco *split-precision craftsmanship* reduces backlash, lost motion, vibration, wear . . . lowers maintenance costs.

For profitable answers to stamping problems, arrange *today* to consult our skilled engineering staff — at no obligation to yourself. Or, better still, visit our modern plant, the largest of its kind in the world.

Warco PRESSES

WARREN CITY MANUFACTURING COMPANY
4127 Griswold Street, Warren, Ohio
A subsidiary of The Federal Machine and Welder Company
Offices in Principal Cities



EUGENE B. MAPEL

Appointed supervisor of education and training, Carnegie-Illinois Steel Corp. Noted in STEEL, Dec. 15 issue, p. 84

ROBERT S. INGERSOLL

Vice president, Ingersoll Steel Division, in charge of manufacturing at company's plants. Noted in STEEL, Dec. 22 issue, p. 60

JOHN C. VELLER

Appointed district sales manager at Davenport, Iowa, Inland Steel Co., Chicago. Noted in STEEL, Dec. 22 issue, p. 56

sentative for the territory including northern Wisconsin, all of Minnesota, N. Dakota, S. Dakota and Montana. His offices are located at 253 Plymouth Bldg., Minneapolis. **C. H. Rodgers & Co.** has been appointed representative for southern Ohio and Kentucky, with offices at 123 E. Sixth St., Cincinnati.

—o—

Lester B. Knight & Associates Inc., consulting engineer, Chicago, announces opening of a New York office at 30 Church St. **F. E. Bradway** will be in charge of the New York office and manager of the Industrial Engineering Division. **J. M. Planten** will be in charge of plant engineering, and **R. L. Ogden,** manager of plant surveys and operation. This new office will be opened Jan. 1.

—o—

James J. Mullen Jr. has been elected president of Moloney Electric Co., St. Louis, succeeding his father, the late **James J. Mullen Sr.** He became affiliated with the company in 1933 as secretary of the corporation. Three years later he became executive vice president, spending most of his time in sales and sales promotion.

—o—

Robert E. Busey has been appointed assistant chief engineer at Willys-Overland Motors Inc., Toledo, O. He formerly had been executive engineer for the White Motor Co., Cleveland. In his new position he will serve as direct assistant to **Walter D. Appel,** chief engineer, in the co-ordination of body and chassis engineering for passenger cars, trucks and jeep models, assuming the responsibilities formerly carried by **Walter Benning,** who has been named a special assistant to **Deimar G. Roos,** vice president in charge of engineering.

—o—

A. B. Muskett, formerly associated for many years with Ford Motor Co. at the Highland Park and River Rouge plants, and more recently with General Motors Corp., Detroit, in executive capacities, has been appointed manager of manufacturing of the General Electric X-Ray Corp. at Milwaukee, a division of General Electric Co. Prior to joining G-E-X-Ray, Mr. Muskett was a manufacturing consultant in the General Electric executive department.

—o—

J. G. Green has been appointed midwestern representative for Chain & Block Corp., Reading, Pa., manufacturer of chain hoists, electric hoists and traveling cranes. He will have headquarters in Chicago, and will cover the Chicago territory to Springfield, Illinois, Wisconsin, and the eastern half of Iowa. He previously had been connected with Westinghouse Electric & Mfg. Co. as manager of industrial sales in the Pittsburgh district office, and for the past five years has been assistant general manager of the Philco Storage Battery Division, Trenton, N. J.

—o—

E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., announces promotion of **Harry F. Brown** to general manager of its explosives department, and **Samuel G. Baker** to general manager of its electrochemicals department. Mr. Brown succeeds **William H. Ward,** who has been elected a vice president of the company. Mr. Baker succeeds **F. S. MacGregor,** who has retired after 31 years with the corporation.

—o—

Walter E. Thill will head field engineering activities for Federal-Mogul Service, Coldwater, Mich.

—o—

Charles L. McCune, president of the Union National Bank of Pittsburgh, has been elected a director of Universal-Cyclops Steel Corp., Bridgeville, Pa.

OBITUARIES . . .

William B. Read, 71, former secretary-treasurer, E. G. Budd Mfg. Co., Philadelphia, died recently after a short illness. Although retired as an officer of the Budd company, Mr. Read continued to serve as a member of the board of directors.

—o—

John P. McCaslin, 68, general superintendent of the former Corrigan McKinney Steel Co., and later plant superintendent when it became a unit of the Republic Steel Corp., Cleveland, died at his home in that city, Dec. 21.

—o—

George B. Fletcher, Chicago representative for Cambridge Wire Cloth Co., Cambridge, Md., died recently after a long association with the company.

—o—

George W. Davis, 50, erecting engineer for Allis-Chalmers Mfg. Co., Milwaukee, was killed Dec. 15 at Miamisburg, O., when the 20-foot boom of a crane fell and struck him while he was supervising the erection of a steam condenser.

—o—

Louis E. McGlaughlin, 67, owner of the Chicago Combustion Co., New York, died at his home in the Bronx recently. He started his company in Chicago and later moved it to New York.

—o—

Louis F. Bardner, 49, director of purchases, Schiavone-Bonomo Corp., Jersey City, N. J., died recently.

Engineering News . . . AT A GLANCE

PROMISING METAL—In attempting to develop a tungsten-free hard metal for tooling, the Germans used vanadium and titanium with iron as a binder, according to the Office of Technical Services, Washington. Both titanium and vanadium carbide were made by carburizing the oxide or sesquioxide in a hydrogen atmosphere. Early samples, the report states, produced surprising results. Few of them withstood cutting speeds above those of tungsten carbide hard metals without cratering. Further development is still required to develop the metal fully; however, it offers great possibilities on the basis of work thus far completed.

WISPY WIRE—In Pittsburgh, it was learned, tungsten wire eighteen-hundred-thousandths of an inch in diameter is the tiniest ever manufactured by Westinghouse Lamp Division. A pound of the wire would stretch about 950 miles, and the filmy strand is so obscure that 1000 feet of it wound on a spool appears invisible to the unaided eye.

MAY BOOST STEELMAKING—Steel production area west of the Mississippi river may get a material boost if tests now being conducted by the University of Utah on western bituminous coal are successful. To determine feasibility of processing the western coal as a source of blast furnace coke, the university is experimenting with briquettes produced by compressing a mixture of powdered coal and pitch. Coke made directly from most western coal lacks necessary strength to support load put on it, and to maintain open spaces through which the stack gases can permeate.

BENEFICIATION—Considerable amounts of fine iron ore particles are lost with the tailings in the beneficiation of ores in the Lake region. Possibility of recovering this ore is limited, according to Arthur D. Little Inc., Cambridge, Mass., by the low value of the iron ore which will not support much beneficiation. Several plants, however, are operating on material from old mine dumps containing residues from the time much higher-grade ores were used. To agglomerate the fine dust into larger particles through magnetic concentration and roasting or sintering, a cheap source of fuel is required.

SUPER "CAN OPENER"—Episodes like the "Battle of Newark" involving the cutting up of a battleship may easily be circumvented by means of a low-cost surface and underwater electric arc-vapor metal cutting tool, demonstrated for the first time recently in the research laboratories of Eutectic Welding Alloys Corp., New York. The special exothermic coating carried by the tool is said to focus and intensify the energy of the electric arc so that steel plates or sections are sliced through with scalpel-like precision, without necessity of elaborate external equipment.

CIRCUIT PRINTING POSSIBILITIES—Technique of printing metal decorations on paper from steel and copper plates offers a possible field for exploration in printed circuits, according to the National Bureau of Standards, Washington. Other variations include direct application of paint to the insulating surface by means of a rubber, metal or plastic block with the circuit design prepared as a cavity or deep etch to hold an appreciable amount of paint. Use of an ordinary lead pencil to draw a high resistance line on a sheet of paper also should not be overlooked, the bureau reports. It is conceivable that pencils may be developed that contain better conducting "leads" so that not only resistors but also conductors may be drawn.

HEATED IN TIERS—In heat treating housings of the draft gears for railroad cars in the Milwaukee plant of A. O. Smith Corp., units are loaded base-end down on a 3-tier vertical heat-resisting alloy rack—eight housings per tier. The rack then is deposited by overhead crane into a gas-fired, radiant-tube furnace submerged below the floor level. Maximum physical properties of the metal are developed by subjecting the housings to a temperature of 1625 to 1650° F for 90 minutes followed by an oil quench. Housings are then given a 800° F draw for 2 hours and air cooled. (p.46)

HELPS THE DESIGNER—The tapered roller bearing, straight spherical rollers and combinations with ball—widely used in railway equipment—offer the designer wide leeway in the matter of making the proper assembly and mounting in many industries, notably for heavy equipment. In case of locomotives, passenger and freight cars, bearings are now being designed and built to fit existing frames. (p.50)

PLANNING IMPORTANT—When sheet and plate are welded, properly designed jigs and fixtures are important for obtaining best results. Furthermore, according to C. G. Chisholm of Haynes Stellite Co., the sequence of welding should be planned to avoid any undue stresses that may result in cracking. Accurate fitting and edge preparation are essential to assure sound welds, and to avoid cracks resulting from notch sensitivity. Formed and work-hardened parts should be annealed before welding. (p.54)

BATH "STOOLPIGEONS"—Because different atoms produce spectra characteristic only of themselves, the spectrograph, in the hands of steelmakers, not only provides a fast analysis of the two or three elements most liable to contaminate the bath, but also simultaneously determines the presence of elements less frequently encountered, but just as undesirable if present. Only remaining task is to identify the various spectra and measure their relative densities to determine the amounts present. (p.69)

News Summary—p. 17 *Market Summary—p. 89*

FABRICATING Rolled Steel

STRONGER and lighter friction draft gears—the units to which railroad car couplings are attached—are now fabricated from rolled steel as a result of the solving of difficult engineering, metallurgical and production drawbacks. In the early 1930's a large supplier of equipment to railroads and car builders turned attention to the idea of making draft gears from rolled steel. Usually the units are made essentially from steel castings.

The Hulson Co. of Keokuk, Iowa, and Chicago, was the originator of the fabricated rolled steel assembly idea; L. M. Clark, engineer, was designer of the new type gear. After several years spent in design and engineering work, the company sought the aid of A. O. Smith Corp., Milwaukee, in solution of the manufacturing problem. The latter undertook exhaustive engineering research in the fields of metallurgy and welding, following which it succeeded this year in working out satisfactory and economical manufacturing techniques.

In October, the Railroad Products division of A. O. Smith and the Hulson Co. jointly announced the Hulson type 202 friction draft gear to be manufactured by A. O. Smith and marketed by Hulson. Fig. 2 shows the component parts and the assembled gear.

A draft gear is the mechanism which absorbs the shock in the motion between cars. A draft gear is required to withstand severe impacts and to need no servicing during its life—a period of 15 years and upward.

Reduction of weight in draft gears is in keeping with the trend in the railroad field toward lighter, stronger and more economical rolling stock. Assembled and ready for installation on any freight car or locomotive tender, the new type 202 gear weighs 202 pounds, or a total of 404 pounds per car set. This car set weight is said to be 249 pounds less than the average of all other draft gears on the market. In a 100-car freight train, the new gear will effect a weight saving of approximately 25,000 pounds, or 12.5 tons.

Incidentally, the new gear is the lightest which had ever been certified by the Association of American Railroads. Out of 50 gears manufactured by A. O. Smith Corp., six were selected at random by the AAR. These were submitted to prescribed tests in the association's testing facilities at Purdue University, West Lafayette, Ind. The gears passed the test successfully and the AAR Draft Gear Committee granted a certificate of approval.

Aside from lightness, the gear has several interesting features. Because it is fabricated entirely from rolled or wrought steel, which can be thoroughly inspected before use, the gear is free from internal defects in the material. Automatic welding equipment provides insurance against failures in fabricating procedure. The retainer bolt, which holds the gear together, is specially designed and forged to withstand shock. The plunger is hot formed, resulting in a bearing surface which requires no machining.

Manufacture of draft gears starts in the A. O. Smith pipe mill with the fabrication of electric welded steel pipe in 40-foot lengths. Steel is AR (abrasive resistant) approximately SAE 1345. Pipe as made is 10¾ inches outside diameter and is subsequently reduced to 7⅝-inch diameter with a wall thickness of 7/16-inch. This pipe is cut to proper lengths of about 2 feet, each length to be formed into a draft gear housing.

First operation is to upset one end of each tube length in a forging press to form the head of the housing. Heating of the tube end is accomplished by electric induction. The tube is placed on a platform and elevated into a specially-designed vertical coil energized by 60-cycle current at 440 volts. Upper end of the tube is heated to a temperature of 2000° F in a matter of about 45 seconds. Upsetting in the Ajax bulldozer follows, as shown in Fig. 3.

Following upsetting, tubes are transferred by roller conveyor to a nearby location where a guide-support, consisting of two formed manganese steel bar sections flash welded together, is slipped onto the upset heads. The guide-supports are permanently attached to the heads by four stud welds made by Unionmelt equipment.

Tubes are now returned to induction heating to have the opposite ends heated preparatory to forming by a double flaring operation and a final forming which results in a rectangular shaped end. After induction heating, the tube is lowered from the coil and transferred by conveyor to a position beneath a vertical gas-fired furnace. Elevated into this furnace, Fig. 4, the tube has its heated end soaked for a short period to equalize the temperature to 1700° F. Soak-

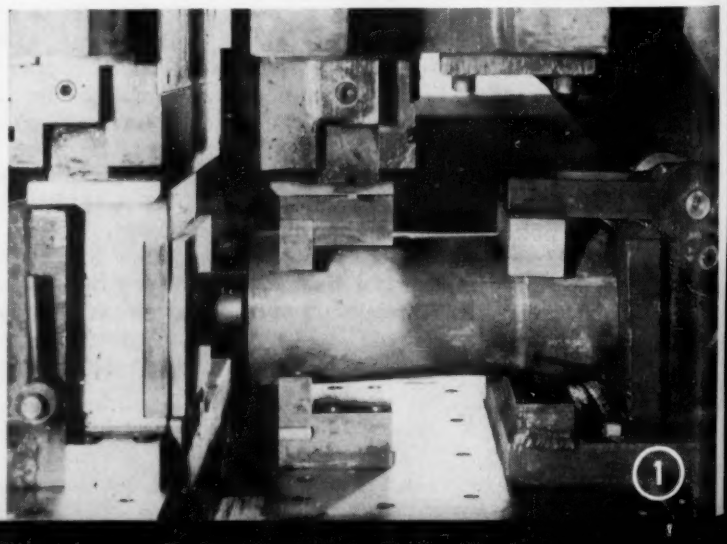


Fig. 1—Tubular section of the housing (center) is automatically positioned onto the rectangular base plate (left) and is then flash welded to it

Fig. 2—Component parts and an assembled friction draft gear. Construction is entirely of rolled or wrought steel

Draft Gears
FOR RAILROAD CARS

Both forging and welding techniques are used in production methods followed by A. O. Smith Corp. to turn out these lighter coupling "shock-absorbers" engineered to withstand repeated severe impacts

By E. F. ROSS
Chicago Editor, STEEL

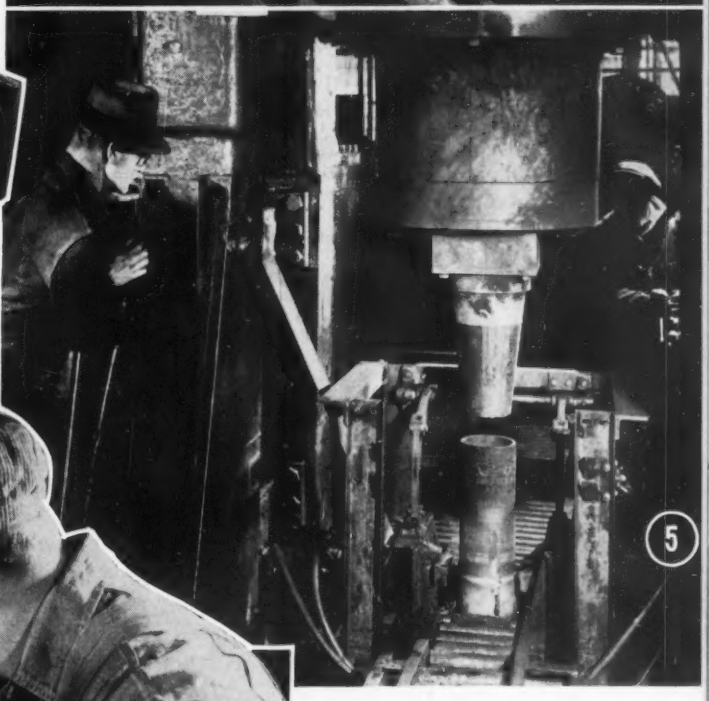


Fig. 3 — Upsetting one end to form the head is one of the first operations on the tubular section of the housing

Fig. 4—Opposite end of the tube is heated by induction followed by soaking in one of three gas-fired furnaces to equalize temperature to 1700° F

Fig. 5—First of two flaring operations on the other end of the tube. Flaring is followed by a final forming of the tube end into a rectangular shape

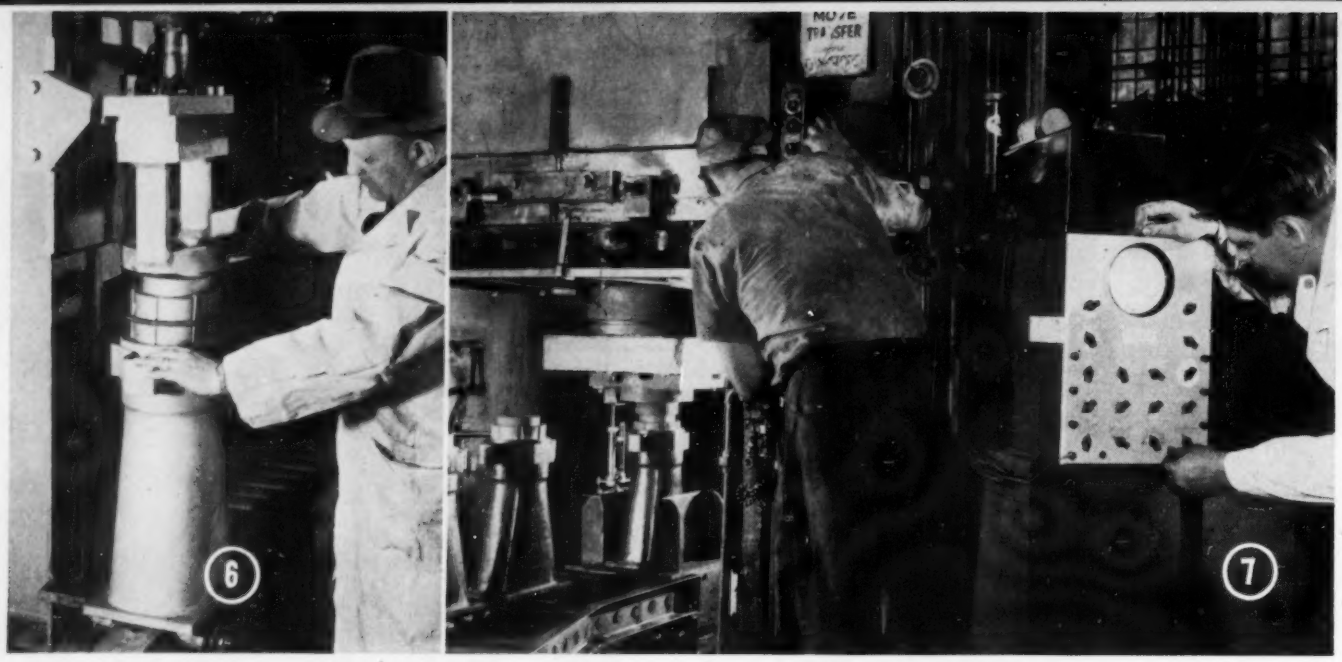


Fig. 6—Assembly of the draft gear is performed in this press. The four shoes are held in position by a coil spring prior to being pushed into the housing. A nut on the end of the retaining bolt holds the assembly together

Fig. 7—A 1500-ton press, operating at 48 strokes per minute, works gear into the desired frictional capacity. Capacity is measured by strain gages and is recorded on the oscillograph at the right

ing is followed by the first forming operation. After this first flaring operation the tubes return to one of the gas furnaces for reheating. First of two flaring operations is shown in Fig. 5.

Lengths of the tubes have been so controlled through the upsetting and forming operations that each tube is ready to be flash welded onto a base without any cutting or other preparations. The base plate, a rectangle of the same steel analysis as the tubular section of the housing and ¾-inch thick, has had a retained bolt boss arc welded to it. Plate and the tubular section are now automatically positioned in a flash welding machine, Fig. 1, and the two parts welded together. About 1 minute is required to complete the weld in a spectacular operation. The resulting assembly is the housing of the draft gear.

To develop their maximum physical properties, housings are heat treated. They are loaded base end down on a three-tier vertical heat-resisting alloy rack—eight housings on each tier—and the rack is deposited by overhead crane into a gas-fired, radiant-tube furnace submerged below floor level. The heat treating cycle is to heat to a temperature of 1625 to 1650° F for 90 minutes, soak for 1 hour, followed by an oil quench. Housings next are given a 800° draw for 2 hours and are air cooled.

Cleaning of the housing is performed in an airless blast equipment after which a brinell check is made. Hardness ranges between 320 and 400 brinell. Housings are now spray painted dark blue.

Final assembly is now undertaken as shown in Fig. 5. Parts involved are the housing, one inner and one outer spring, spacer, equalizer, four shoes, plunger, and retainer bolt and nut. The springs, spacer, equalizer and shoes are purchased from outside sources. The plunger is made by A. O. Smith in a 9000-ton mechanical press which transforms a piece of 0.20 per cent carbon bar steel into the final form in one pass. Assembly of the components is performed in a press, Fig. 6, which compresses the springs while the nut is placed on the retainer bolt. From assembly the gears are moved away on a gravity roller conveyor.

It is now necessary to work the gear into the desired capacity. This is done in a 1500-ton press, Fig. 7, equipped with special gears which work the draft gear up and down 48 times per minute. The shoes rub against the housing and develop enough contact for the required capacity. Thus it requires minimum expense to accomplish what would cost considerable by any machining operation. The frictional resistance that is being built up in the draft gear is measured by strain gages, attached to the press which, in turn, is recorded on an oscillograph located adjacent to the press.

At this point it is of interest to note that in this new type friction draft gear, forged steel works against forged steel (the shoes against the housing) for the first time. Heretofore, it has always been a case of a forging working against a steel casting.

Final inspection follows the working in of the gears to capacity. At this point the nut on the retainer bolt is arc welded to the bolt to prevent the nut from backing off in service or to discourage disassembly of the gear during its normal life.

The department in which the draft gears are made was set up in the A. O. Smith plant after the company had completed its extensive research program. Equipment is so placed as to be compact and yet provide as near straight-line production as is possible. Maximum use is made of conveyors to handle parts in process from one operation to another. Current output is 200 draft gears a day, a figure controlled by heat treating capacity. However, space is provided for additional heat treating facilities when they may be required.

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

MACHINES IN MARSHALL PLAN: In a year's end conversation with Tell Berna, general manager, National Machine Tool Builders' Association, I have just picked up some interesting thoughts on how war-ravaged people can best be helped to help themselves—which is the only kind of help which is going to amount to anything in the long run.

Tell Berna's theory, which seems thoroughly sound, is that the "back to work" movement abroad is hampered by ruined or inadequate mechanical equipment—or out and out lack of it. Of primary importance is agricultural equipment, if the stricken countries are to feed themselves within any reasonable length of time and to any reasonable degree.

If previous experience in Russia is any criterion, mere export of tractors, harvesters, etc., will not serve the purpose nearly as well as having foreign countries build their own equipment which they prefer and understand and for which service and repair parts then will be available without further dependence on America and without any long waiting period. In Russia, tractors and other machines of American make rusted in the fields for lack of simple repair parts and lack of knowledge of how to make simple repairs and adjustments.

As Tell Berna sizes up the situation, the first thing to do under the Marshall plan is to get a lot of people to work as soon as possible with American machine tools—not necessarily tools of the most complicated type — manufacturing agricultural machinery and parts and other basic machinery and parts, so that many people will have work immediately making equipment which will give a lot of work to a lot of other people whose work in turn will serve to feed, clothe and house the millions who otherwise will be dependent on the bounty of America for a long time

To paraphrase what Winston Churchill said at a previous critical time: "Give them the tools and they will finish the job!"

ANALYZING HANDLING: With the Materials Handling Show in Cleveland Public Auditorium on the docket for the week of January 12, 1948, I have been restudying with particular interest some of the papers which were delivered at the Materials Handling sessions at the recent annual meeting of the American Society of Mechanical Engineers.

S. C. Hoey, director, headquarters manufacturing department, Westinghouse Electric Corp., in dealing with co-ordination of materials handling with the manufacturing cycle, analyzed the general situation in this way: "When manufacturing any item, it will be found that numerous operations are performed on it. The average number is five. Multiply this by the number of items made and then multiply by the number of moves at each operation. The result shows a sizable handling job.

"To illustrate this point from another aspect, multiply the weight of each piece by the number of pieces times the number of moves made. You will discover that some *real tonnage* is being handled.

"Now compare this total tonnage moved to the total weight of the material received in the plant. Believe it or not—you are likely to find that a ratio as high as 150 to 1 of material handled to material received, exits.

"Does that leave you satisfied that a good job is being done, when it is remembered that all this handling has not added one cent of value to the product, while most certainly it has done something undesirable to its cost?

"This matter of handling materials presents to industry the greatest opportunity for cost reduction available today, and it constitutes a real challenge to our ingenuity. The answers are neither easy nor simple, but by applying sound principles of manufacturing analysis and good engineering practice, we certainly can bring about the desired results to the ultimate benefit of everyone."

GOSS & DELEEUW'S TWENTY-FIFTH: I have just received from my friend Stanley Goss a reminder that the independent machine tool manufacturing enterprise launched by him and by the late Adolph L. DeLeeuw has now rounded out a quarter of a century of highly successful operation. This reminder comes in the form of a handsome anniversary book which is a valued addition to my private library of the machine tool industry.

This event and this book are of particular interest to me for the reason that I knew Mr. Goss and Mr. DeLeeuw back in the days when the Goss & DeLeeuw Machine Co. was only a dream in the back of their minds, because I saw some of the early machines—whose parts were at that time manufactured by American Machine & Foundry Co., Brooklyn, N. Y.—being assembled and tested in what had been a macaroni factory near the railroad station in Berlin Junction, Conn., and because an old schoolmate of mine—the late Stoddard B. Martin—represented Goss & DeLeeuw in Cleveland up until he was accidentally drowned in October, 1945, while on a hunting trip.

Each of the founders of this company was a genius in his own particular way and each had long experience which their combined forces merged into action which spelled success from the start. The history of the machine tool industry is marked by a number of instances where just such fortunate combinations of energy and genius have made new industries spring up and grow—industries which have made a lot more goods available to a lot more people because they applied automatic principles to the manufacture of parts which previously involved costly and tedious manual operations.

ANTIFRICTION B

By L. E. BROWNE
Associate Editor, STEEL

Part 4 of the series, this section deals with various bearings used in antifrictionizing railroad rolling stock

TRANSPORTATION and the heavy industries, notably railroads and steel, from the first have been alert to longer life, power savings, increased availability and higher operating efficiency of antifriction bearings. Antifrictionization of freight car equipment, now under way and gaining momentum is probably the last step so far as roller bearings are concerned in the railroad field.

For heavy-duty work, operational factors often make it necessary to design and construct a bearing with suitable mounting, capable of taking a heavy radial or thrust load and frequently any combination of the two. For this requirement, tapered roller bearings have wide application. Especially noteworthy is acceptance of tapered bearing and spherical roller designs on railroad equipment.

Locomotives, passenger and Pullman cars have been equipped with roller bearings for 25 years or more with progressive improvements in design and construction. Railroads are now showing increasing interest in equipping freight cars and several thousand units are in service and on order, Fig. 18; included are 300 live stock cars, equipped for the Union Pacific with Timken tapered roller bearings. In nonstop diesel service, westbound schedules between Salt Lake City and Los Angeles will be reduced from 60 to less than 30 hours, Fig. 19.

While some railroads may more or less delay freight car applications until cars now under construction are further tested in service, the number now installing antifriction bearings is sufficient to indicate the time is not far distant when many additional applications will be made.

There are four more or less standard types of journal roller bearings for railway cars. All, straight cylindrical or spherical roller, tapered rollers and combinations of roller and ball bearings, are being installed on new passenger cars, Fig. 20.

The tapered roller bearing, straight spherical rollers and combinations with ball, widely used in railway equipment offer the designer wide leeway in the matter of making the proper assembly and mounting in many industries.

In the case of locomotives, passenger and freight cars, bearings are now being designed and built which will fit existing frames. Timken Roller Bearing Co., Canton, O., designed a car truck, tested by the Pennsylvania Railroad, with the bearings inside the sideframe. This radical development, however, involves problems of maintenance and lubrication when the car is far distant from the home shops. The AAR has adopted outside bearings as standard.

Starting resistance of antifriction bearings is approximately 89 per cent less than for solid bearings and there is no appreciable increase in resistance in cold winter weather in contrast to the rise generally experienced under those conditions for solid metal bearings. Antifriction bearings are designed to utilize standard lubriacting oils, same as for brass, somewhat lighter than 600W.

The General Motors Train of Tomorrow has a new type of Hyatt roller bearing journal box applied to trucks of the locomotive and cars which makes an outstanding contribution to smoother riding. This is the first entire train to be equipped with the new Hyatt design in which lateral axle movement is controlled and cushioned by a special synthetic rubber part, Fig. 21.

This rubber cushion is interposed between the axle thrust block which intermittently contacts end of the axle and outside cover of the journal box; smoother starting and reduced side sway results. While this rubber-cushion type of bearing is new for passenger trains, Hyatt journal boxes of this design have been used for hundreds of thousands of miles under General Motors diesel locomotives. This bearing is a further development of the Hyatt design widely used under passenger equipment, some being

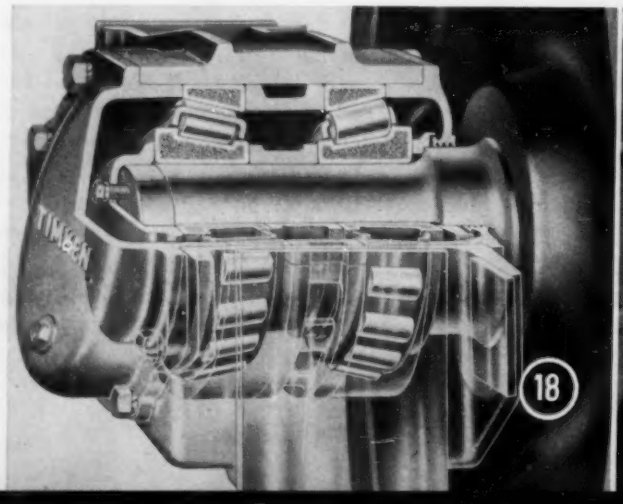


Fig. 18—Double row tapered journal box roller bearing, among the standard designs adopted for freight cars

Fig. 19—(A and B) —This Timken bearing and box assembly fits into the friction bearing side frame of the integral box type

N BEARINGS

in their third million miles. There are 44 of these bearings applied to the trucks of the Train of Tomorrow, installed in the outside swing hanger in the case of passenger car trucks.

Tapered roller bearing, designed to take both radial and thrust loads or combinations of both, is therefore ideal for many heavy-duty applications. The majority of steel mills are equipped with this type of roll necks, screw downs, mill drives, tables, pinion stands and auxiliary equipment.

In railroad equipment tapered rollers of single-row, two-row and four-row design are employed. The standard freight car bearing is of two-row design. Widely used on steam locomotive engine trucks is a single-row, one-piece tubular housing application, Fig. 22. For driving axles a split-type tubular housing application with double bearing is popular for existing and newly built steam locomotives, this bearing being interchangeable, Fig. 23. A four-row tapered railroad application which interchanges with all sizes of friction bearings and fits into existing trucks without change is replacing solid metal bearings; this type of bearing is being used on the 500 refrigerator cars for the Railway Express, Fig. 24. On diesel locomotive trailers and tenders and passenger car equipment two-row tapered and straight

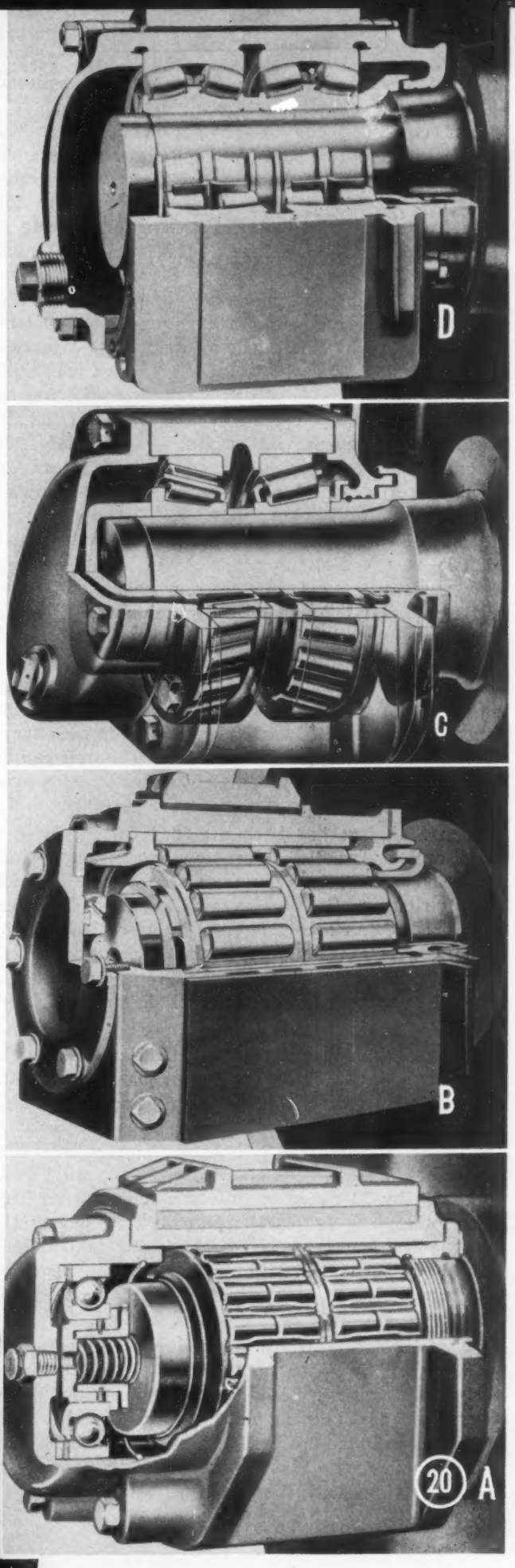


Fig. 20—Four types of antifriction journal bearings for railway cars being installed on hundreds of new passenger cars: (A) Double two-row straight roller in combination with preloaded single-row ball bearing; (B) double row straight roller bearing in simple design with heavy rolling units; (C) double row tapered bearing design reducing side-sway; (D) two-row tapered bearing

roller types are used, the tapered "dual" railroad journal application being shown, Fig. 25.

For equipping the 300 live stock cars for the Union Pacific, the Timken bearing and box assembly fits into the friction bearing side-frame of the integral box type. The only change necessary in the side frame for mounting the antifriction bearing is removal of dust guard lugs at the rear of the integral box.

Spherical roller bearings are being installed on 350 IRT division cars, New York City subway system, 2800 units to be housed in all-welded steel journal boxes, developed jointly by SKF Industries Inc., Philadelphia, and the Welded Products Division, American Car & Foundry Co., Berwick, Pa. Use of the all-welded steel journal box saves approximately 400 pounds of unsprung weight for each subway car. A double row spherical roller bearing is incorporated in this design.

The SKF freight car journal box houses two double row self-aligning spherical roller bearings. For modernizing existing passenger cars and other rolling stock, SKF developed a roller bearing journal box assembly which also can be installed by railroads in their own shops; this assembly, a grease-lubricated unit, consists of a multi-row cylinder bearing and a single-row ball bearing. For installation, only simple machining of axle journals is necessary; new truck frames are not required. The unit can be installed in standard pedestal openings of passenger cars and other rolling stock.

The SKF box has been designed for use with a steel arch or "saddle" to provide a wide range of applications to various types of railway truck and spring-rigging. This arch rests atop the journal box and provides an equitable distribution of load on the rollers, substantially increasing bearing life. This box also is designed to provide for application of special equipment including wheel slide control.

First definite progress in applying antifriction bearings on passenger cars was made more than 20 years ago when 150 cars were equipped for the Milwaukee's Olympian and Pioneer Limited, making possible longer trains with the same locomotives. American Locomotive Co. built for Timken in 1928 a roller-bearing equipped steam locomotive which was operated by 14 different railroads for testing. This locomotive now serves the Northern Pacific on the Seattle-Tacoma run; since 1936-37 all steam locomotive have been equipped with antifriction bearings. Savings in lower maintenance cost, road inspection, repairs and lubrication have been marked.

Norfolk and Western applied roller bearings in 1939-40 to 19 heavy compound Mallet locomotives originally constructed in 1930-32. Accurate figures were kept on the availability, average monthly mileage and maintenance cost per locomotive mile, both before and after conversion of these locomotives to roller bearings with these results:

	Friction bearings	Roller bearings
Per cent availability	50.7%	61.9%
Average monthly mileage	3902	5581
Maintenance cost per locomotive mile, including classified repairs	$0.3777	$0.1845

For this railroad 11 streamlined 4-8-4 type passenger locomotives were built in 1941-43 and equipped with roller bearings on all engine and tender journals, crank pins and valve gear. Drawbar horsepower of this type is in excess of 5000 and the locomotives were primarily designed to haul heavy passenger trains over mountain grades, but where grades and curvature permit, speeds in excess of 100 miles per hour have been reached. These locomotives have an assignment of approximately 15,000 miles a month per unit, but on a longer road where increased passenger runs could be assigned, mileages well in excess of 15,000 per month could be made.

Availability of these locomotives is 72.6 per cent and the average maintenance cost per locomotive mile is $0.15, based on records kept since the engines were placed in service.

Experience of other railroads with roller-bearing equipped steam locomotives has been as satisfactory. G. L. Ernstrom, general mechanical superintendent, Northern Pacific, summarizes advantages to include: (1) Hot boxes are practically eliminated; (2) reduction in lubrication costs; (3) reduction in journal friction, particularly at starting, permitting heavier trains; (4) lower maintenance costs; (5) greater availability, about 25 per cent compared to plain bearings; and (6) make longer engine runs possible.

Covering 18 months, Northern Pacific maintained test records on eight 4-6-6-4 type locomotives equipped with Timken tapered roller bearings on all driving axles and four of the same class with plain bearings on all drivers. Cost per mile, including inspection, lubrication and repairs, was $0.05114 for antifriction bearing equipped locomotives compared with $0.07491 for plain bearing units. Mileage of roller bearings has frequently been between 500,000 and 600,000 miles before replacement.

Longer runs with fewer engine changes are a valuable contribution to railroad operation by the antifriction bearing; New York Central now operates an antifriction bearing equipped locomotive from Harmon, N. Y., to Chicago whereas previously several changes were necessary. While the antifriction roller bearing has played a leading role in increasing the utilization of the locomotive at lower maintenance costs, there are other contributory factors.

The modern steam reciprocating locomotive differs from the earlier conventional type in that it has a higher capacity boiler, roller bearings, integral cast steel bed frame, better counter-balancing and mechanical and pressure lubrication; these design improvements have also played a part in increased efficiency and better performance. An important development in the early 30's was the redesign of reciprocating parts and the use of alloy steel (SAE 4340 modified) to reduce weight; tubing for piston rods, forged pistons and cross-heads, forged aluminum cross head shoes and the use of alloy steel in crank pins are other advances.

Despite wide acceptance of the antifriction bearing for transportation equipment, its application to freight cars bids fair to be an outstanding development during the next few years. Some large orders have been placed, including 1000 seventy-ton capac-

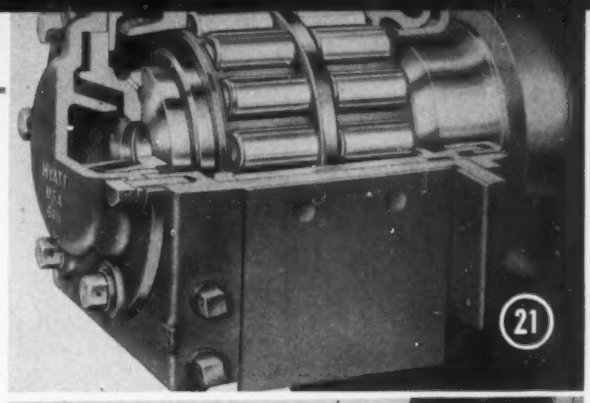
Fig. 21—Double row straight roller Hyatt bearing with rubber cushion between the axle thrust block and outside journal box cover, reducing side sway on Train of Tomorrow

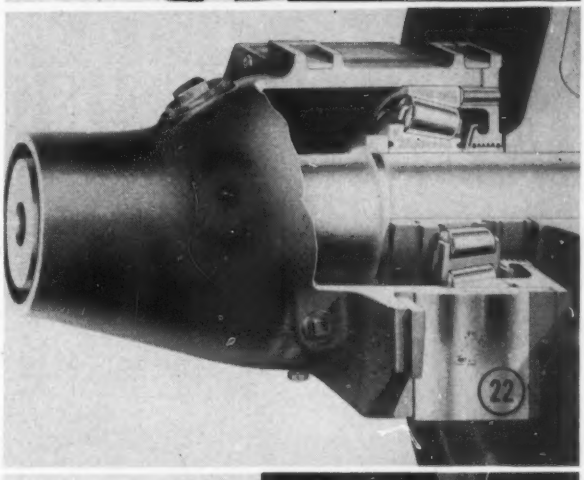
Fig. 22—One-piece tubular housing Timken application, single row tapered design used on steam locomotive engine trucks

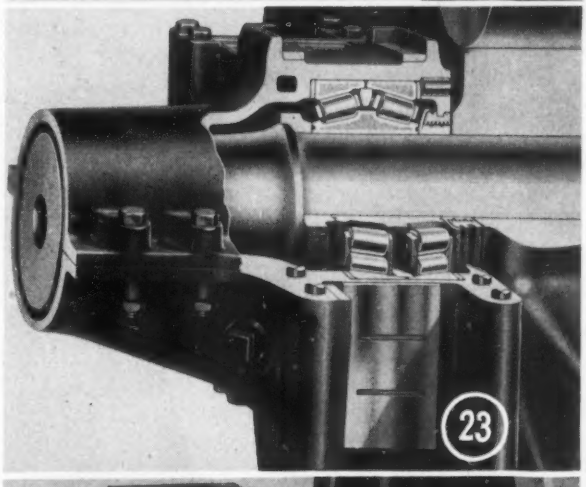
Fig. 23—Interchangeable type for steam locomotive driving axles; double tapered Timken design, split type tubular housing application for existing and new locomotives

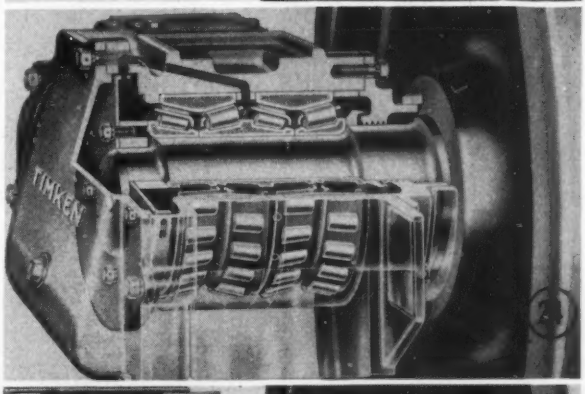
Fig. 24—This four-row tapered bearing, used on 500 high speed Railway Express cars, is interchangeable with all sizes of friction bearings, fitting into existing trucks without change

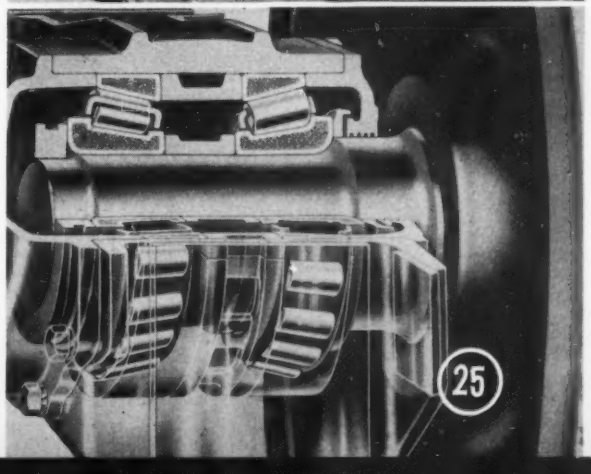
Fig. 25—Dual railroad Timken journal application for locomotive trailers, tenders and passenger car equipment; also used on diesel locomotives











ity hoppers by the Chesapeake & Ohio and 500 stainless refrigerator cars by Railway Express Agency.

Since the first orders for antifriction bearing journal boxes were entered late in 1946, the trend toward high-speed freight transportation has gained momentum rapidly. For the 1500 hopper cars noted above, 12,000 high precision roller bearing assemblies will be required. Several bearing producers are now in mass production with new or expanded assembly lines for journal boxes and bearings.

Coal hoppers equipped with roller bearings can be started with one-eighth the power required for a similar car with friction bearings. The same locomotive required to haul a given number of 50-ton hoppers can handle a similar number of 70-ton capacity cars. New refrigerator cars are designed for speeds to 100 miles an hour and may be coupled to crack passenger trains with distinctive outside finish to blend with streamliners. These cars can be converted in a few minutes to carry merchandise express and with auxiliary hot water heaters can protect perishables in cold weather. They have a normal capacity of 50 tons.

In cost, the antifriction bearings account for about 10 per cent of the total $7.5 million contract covering these 500 refrigerator cars, but the Railway Express Agency specified this type of antifriction journal based on past experience with bearings; 18,000 of the company's delivery trucks and all its platform-loading trailer trucks are ball and roller bearing equipped.

The hot box has always been a problem in railroad maintenance and operation. The roller bearing journal box practically eliminates this danger and also the stuffing box in which oil with waste is jammed under the axle to lubricate the shaft as it revolves against the solid metal of a plain bearing. When oil or waste is insufficient to provide a film of lubrication between the turning axle and the stationary bearing, a hot box results. If neglected, there is danger of a hot bearing eventually burning a wheel from its axle. Large maintenance crews, close inspection and lubrication systems are required to prevent hot boxes with older equipment.

(To be continued)

Welding Characteristics

OF HIGH TEMPERATURE ALLOYS

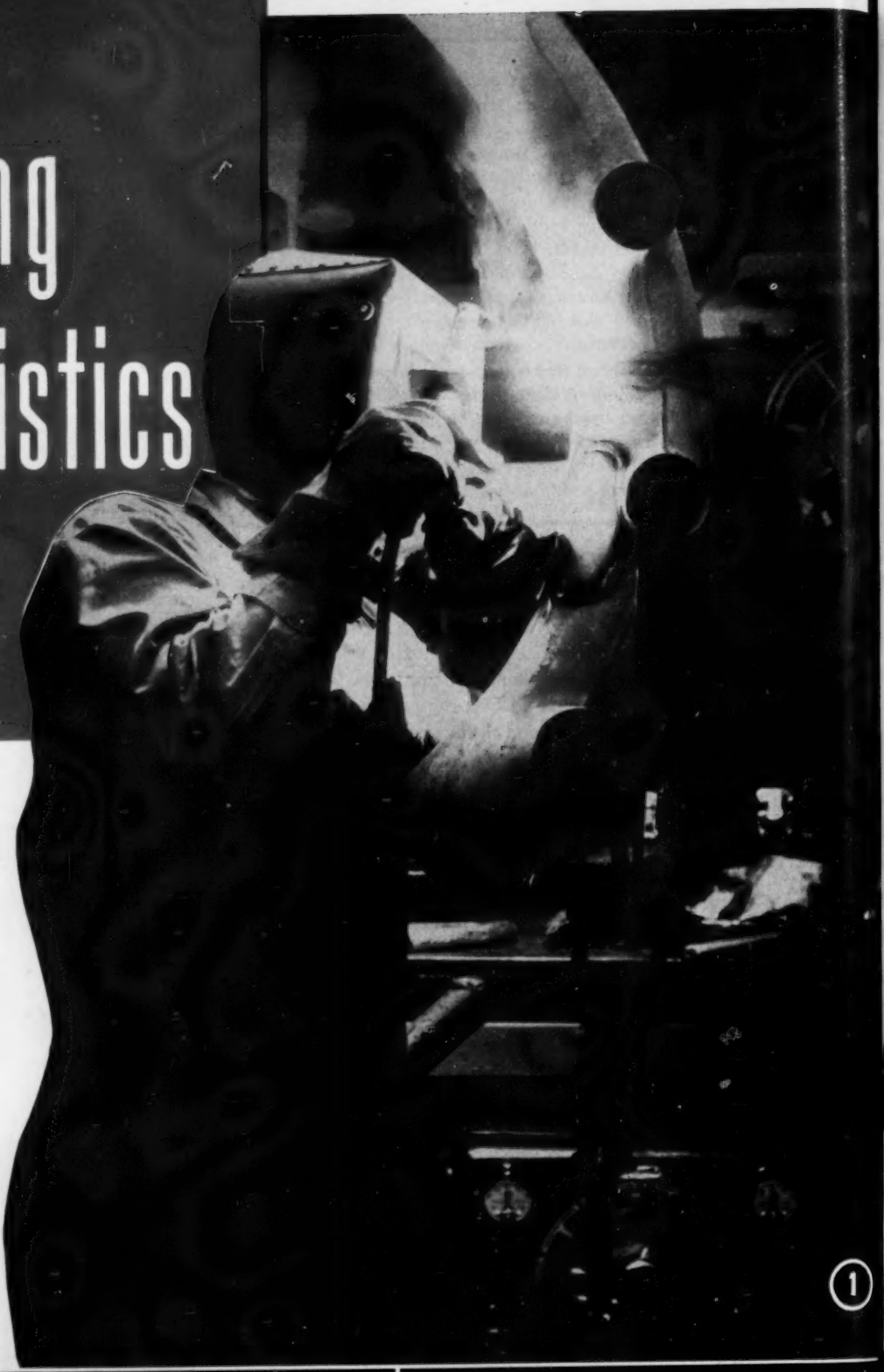


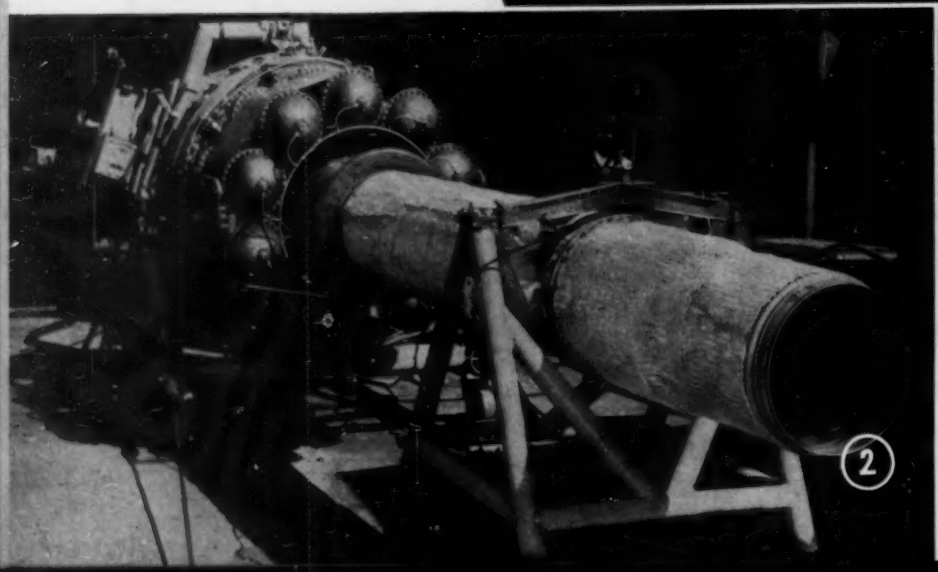
Fig. 1—Welding parts together to form collector ring assembly

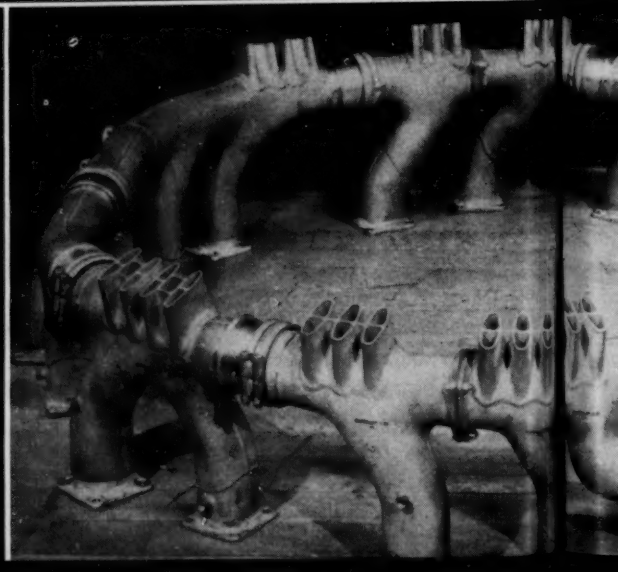
Fig. 2—Typical tail pipe installation on jet engine

Fig. 3 — P2V2 collector ring showing precision cast jet augmentation nozzles. Figs. 1, 2, 4 & 5, courtesy Ryan Aeronautical Co.

Fig. 4—Spot-welding collector-ring ducts

Fig. 5 — Longitudinal roller-seam weld, nickel-base alloy





In this timely discussion the author points out that most high temperature materials can be joined by practically all welding methods. Choice of joining process depends upon equipment available, part to be welded, as well as service for which it is intended

EVER since their introduction, the use of the new high-temperature alloys has been confined, almost exclusively, to the aircraft industry. This is understandable because these alloys were developed primarily for the buckets and blades of aircraft supercharger and turbo-jet engines. Then, too, the development of these alloys was withheld from many industries because of wartime secrecy. This restriction of information, while entirely necessary, has prevented many concerned with high-temperature problems from experimenting with the alloys under their own operating conditions. This is especially true in such fields as industrial power and chemical processing.

Some of this lost time has, of course, been offset by the reports and articles on the physical, chemical, and metallurgical properties of these alloys that have been released in the past year or so. However, the full development of these alloys as practical materials of construction for all high-temperature applications has been retarded because little information has been published on their welding characteristics. Actually, no more problems are encountered in welding these alloys than with more common materials of construction, providing proper welding techniques are employed.

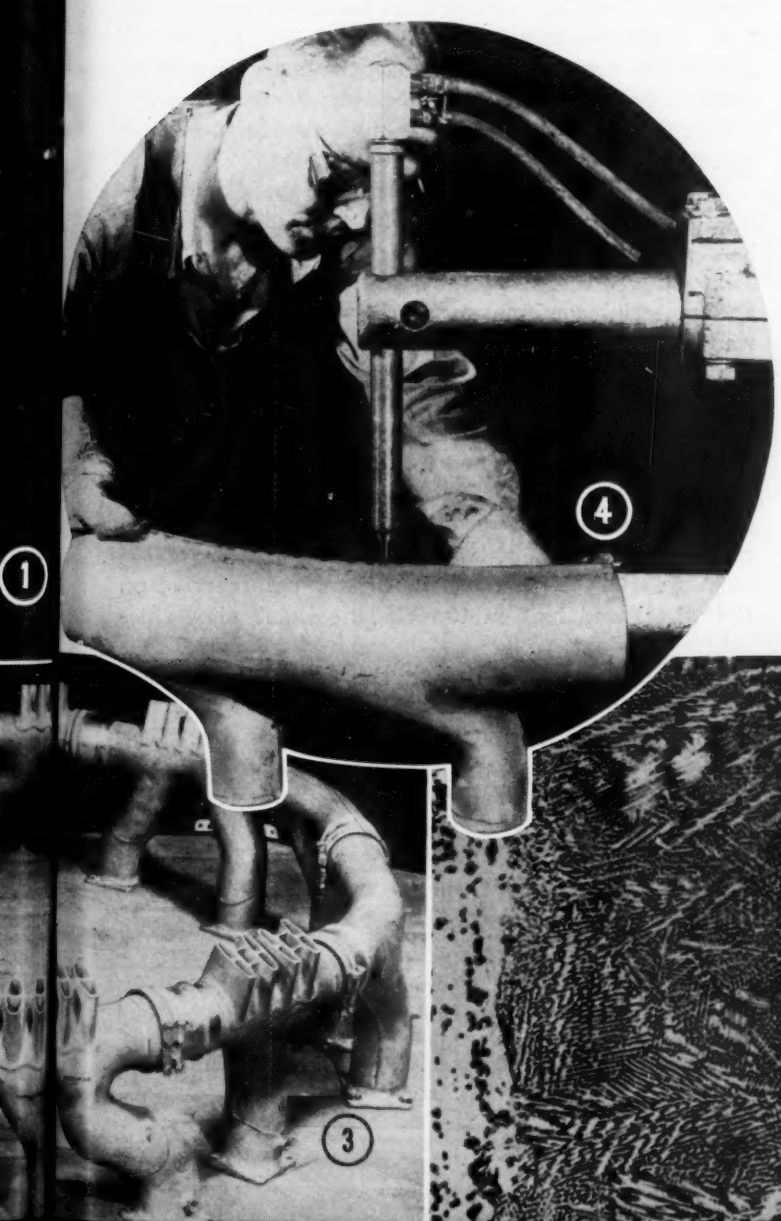
For the purpose of discussing their welding characteristics, these alloys may be divided into three general groups. These are: Group I, cobalt and cobalt-nickel-base alloys; group II, nickel-base alloys; group III, cobalt-nickel-iron base alloys.

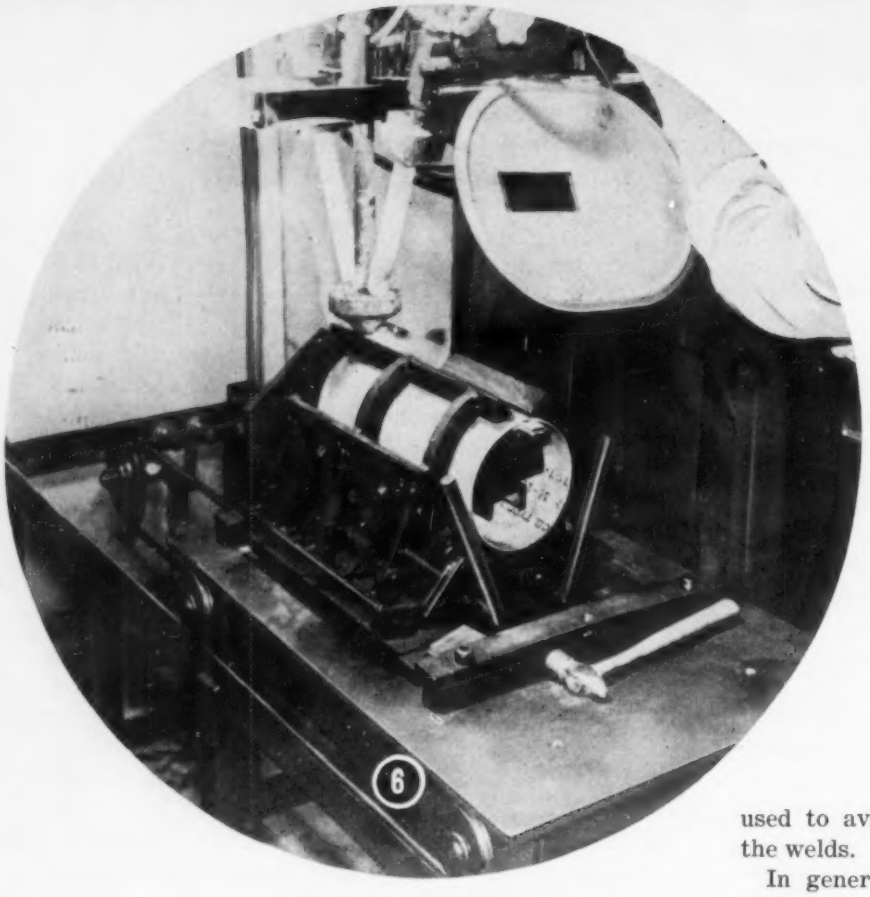
With regard to the physical properties of these alloys at room temperature, ultimate tensile stengths and yield strengths decrease from group I to group III; the elongation values increase. This means that the alloys in group I are more difficult to work and form than the alloys in group II or group III. This is also true of the welding characteristics—but not to the same degree.

All the alloys can be welded by all methods common to the austenitic stainless steels. They may be welded to each other or to dissmilar alloys. The coefficients of expansion are about 50 per cent greater than those of mild steel, and the heat conductivity is only about one-fourth that of low-carbon steel. Electrical resistance, particularly in the work-hardened condition, is higher than that of carbon steel. Because of these properties, the usual care must be taken to prevent distortion and residual welding stresses.

When sheet and plate are welded, properly designed jigs and fixtures are important for obtaining best results. The sequence of welding should be planned to avoid any undue stresses that may result in cracking. Accurate fitting and edge preparation are essential to assure sound welds, and to avoid

By C. G. CHISHOLM
Haynes Stellite Co.
Kokomo, Ind.





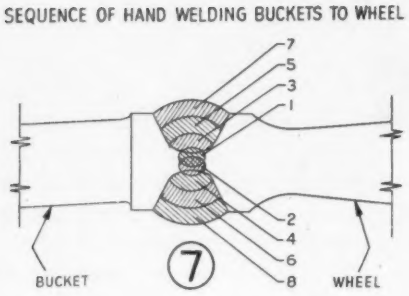


Fig. 6—Welding combustion chamber by mechanical atomic-hydrogen welding. Courtesy Northrup Aircraft Co.

Fig. 7—Sequence of hand welding buckets to wheel

cracks resulting from notch sensitivity. Formed and work-hardened parts should be annealed before welding.

Resistance Welding—Correct surface preparation is one of the most important factors for insuring sound and reproducible welds, especially when welding these alloys by the spot, roller-seam, or flash-welding methods. All parts should be thoroughly cleaned on both sides, preferably by pickling. If pickling facilities are not available, the part may be cleaned by a light sand blast or by buffing with emery. However, the results will be less satisfactory.

Parts that are too severely work-hardened should not be welded because previous forming operations cause rapid increase in electrical resistance.

Fig. 4 illustrates how welding is used to tack sheet-metal parts together prior to fusion welding operations. This shows two aircraft collector ring stampings being joined for this purpose.

The alloys in groups II and III can be joined by roller-seam welding; long welds have been made successfully by this process. Fig. 2 shows a stainless steel exhaust stack on a jet engine that was fabricated by roller-seam welding. Similar sheet-metal parts have been made from Hastelloy alloy C and Multimet alloy sheet. Photomicrograph, Fig. 5, made from weld sections of exhaust stacks, show that the welds produced are sound, clean, and strong.

Metallic-Arc Welding — Metallic-arc welding is a satisfactory method for joining the alloys because it is fast and accurate. Direct current with reverse polarity generally is employed. As with other materials, rapid travel without weaving is used to avoid a wide heat-affected zone. Minimum currents, consistent with the gage or size of the parts, should be used to avoid overheating and resultant porosity in the welds.

In general, joint designs established for stainless steel are acceptable for joining high-temperature alloys. Coated electrodes are available for joining all of these materials. Fig. 4 shows the operator joining sheet-metal parts in a collector ring by the metallic-arc process. Same method is used to join precision investment castings to sheet-metal parts, Fig 3.

Joining blades to wheels for high-speed gas turbines and rotors was one of the most difficult problems encountered in welding high-temperature alloys. This job was complicated by a multiplicity of designs and material combinations. However, the problem was solved and, by employing the following procedures, blades are now successfully joined to wheels by both the hand arc and the "Unionmelt" methods.

One hundred Haynes Stellite alloy No. 30 blades, 2 inches long, were joined to a "16-25-6" alloy wheel, ½-inch thick and 15 inches in diameter, by manual metallic-arc welding. A standard AWS U joint, with a tang width of 0.090-inch and a groove width of ½-inch, was used. Half of the U form was carried on the wheel and half in the blade. Fig. 7 shows details of the joint.

The deposit was laid into the center line of the groove. Eight passes were made, each pass penetrating at least 30 per cent of the previous one. The first and second passes were made at the root of the weld. Each one was allowed to penetrate at least 75 per cent in order to insure good penetration and to prevent root cracking. Stringer passes, with no weaving, were made about the center line of the weld. Each pass had a width of about 2½ times the diameter of the electrode.

First two passes were made with 5/32-inch diameter electrodes, and the other six passes were made with 3/16-inch diameter electrodes. All eight passes could have been made with 5/32-inch electrodes but

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However, the manufacturer of oxygen producing or handling equipment must consider more than the above-mentioned properties. He must insist that the materials used be immune to any adverse effects low temperatures may have. Many commercial alloys become increasingly brittle and lose their ability to withstand sharp blows as the temperature drops. But here again, there need be no worries with respect to copper and its alloys. Note the improvement at low temperatures in strength, ductility *and* resistance to impact for three copper base alloys:

Alloy (Annealed)	Temperature, °F.	Tensile Strength, psi.	Elongation, % in 2 in.	Impact Resistance—ft/lb, Izod Specimens
Deoxidized Copper	Room	31,400	48	43
	—292	58,000	58	50
Cupro Nickel, 30%	Room	70,800	41	90
	—292	112,700	51	97
Cartridge Brass, 70%	Room	51,100	49	66
	—292	73,500	75	79

(Tests on 0.25 in. diameter specimens)

Other Revere alloys, such as Herculoy (High-Silicon Bronze, A) show similar excellent properties at depressed temperatures.

Therefore, in designing oxygen plants, to play safe, specify copper-base alloys. Revere's Technical Advisory Service will be glad to assist in the selection of the proper alloys to meet your requirements.

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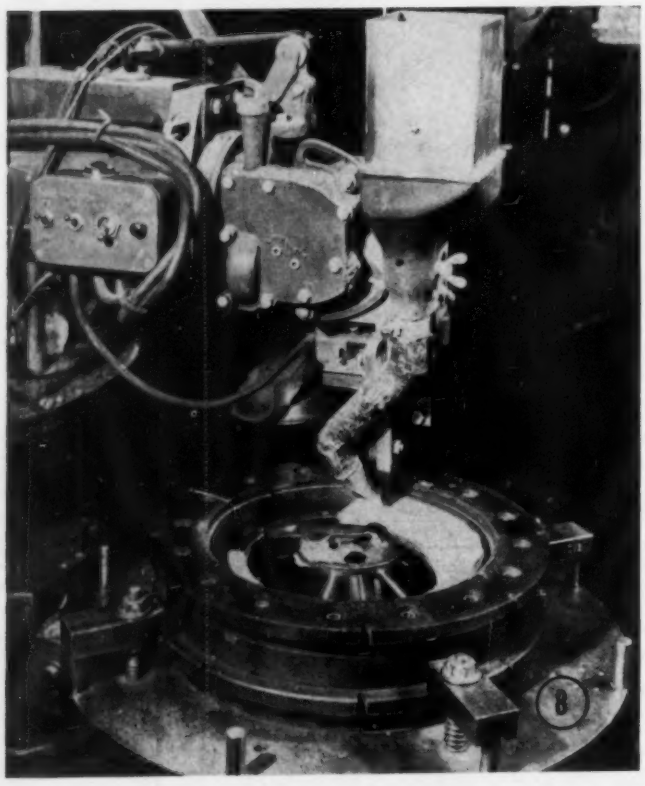
the process is speeded up through the use of 3/16-inch rod.

Naturally, the more even the preheat temperature is held throughout the welding cycle, the less susceptible the assembly will be to cracking from the setting up of unequal stresses. Therefore the highest current values consistent with good practice were used to minimize any drop in temperature during the welding operation. Blades and wheels were preheated to 600° F. By working out a proper balance between electrode size and current values, only 50 to 75° F was lost during the eight passes. Current values ranging from 15 to 20 per cent higher than the manufacturer's specifications for the electrode were used in this case.



Unionmelt Welding—The Unionmelt welding process of The Linde Air Products Co. consists of welding electrically beneath a granulated material. This process produces welds that are dense, clean and smooth, and have good penetration. Fig. 9 shows a typical automatic setup.

This process is especially adaptable to production welding because it is fast. For example, one fabricator joining 144 blades to a 12-inch diameter wheel was able to obtain welding speeds of from 18 to 30 inches per minute by using current values of 350 to 360 amperes. He used a 316 KA2SMO electrode, ⅛-inch in diameter, deposited under Unionmelt No. 80, size 12 x 200. One-pass welds were made on either side of the wheel and the rod was deposited angularly into the joint from the wheel side. Flat-base blades without wheel grooves are acceptable for this application.

Usually a small circumferential groove or notch may be machined into the wheel in order to facilitate placement of the rod. Most important factor in making strong welds is to reduce to a minimum the amount of unfused blade base in the weld areas. Fixture design is also an important factor in producing strong welds. Fig. 8 shows a typical fixture for welding blades by the "Unionmelt" process.

Fabricators are experimenting with this process for other applications involving the welding of high-temperature alloys. One manufacturer recently used Hastelloy alloy B and C wire with the Unionmelt process, and is experimenting with a modified alloy B wire with a 5 per cent chromium addition.

Atomic-Hydrogen Process — The atomic-hydrogen process has been used for production welding these alloys, and is particularly applicable for welding sheet-metal parts. In this process, the solidifying weld metal is protected from oxidizing by a blanket of hydrogen gas. No flux is required when welding with the atomic-hydrogen process, and bare welding rods may be used as a filler. Fig. 6 shows an auto-

Fig. 8 — Details of fixture for welding supercharger wheels

Fig. 9 — Unionmelt installations for production welding super-alloy wheels

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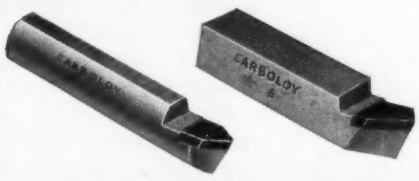

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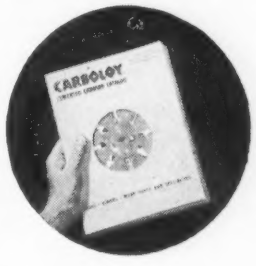

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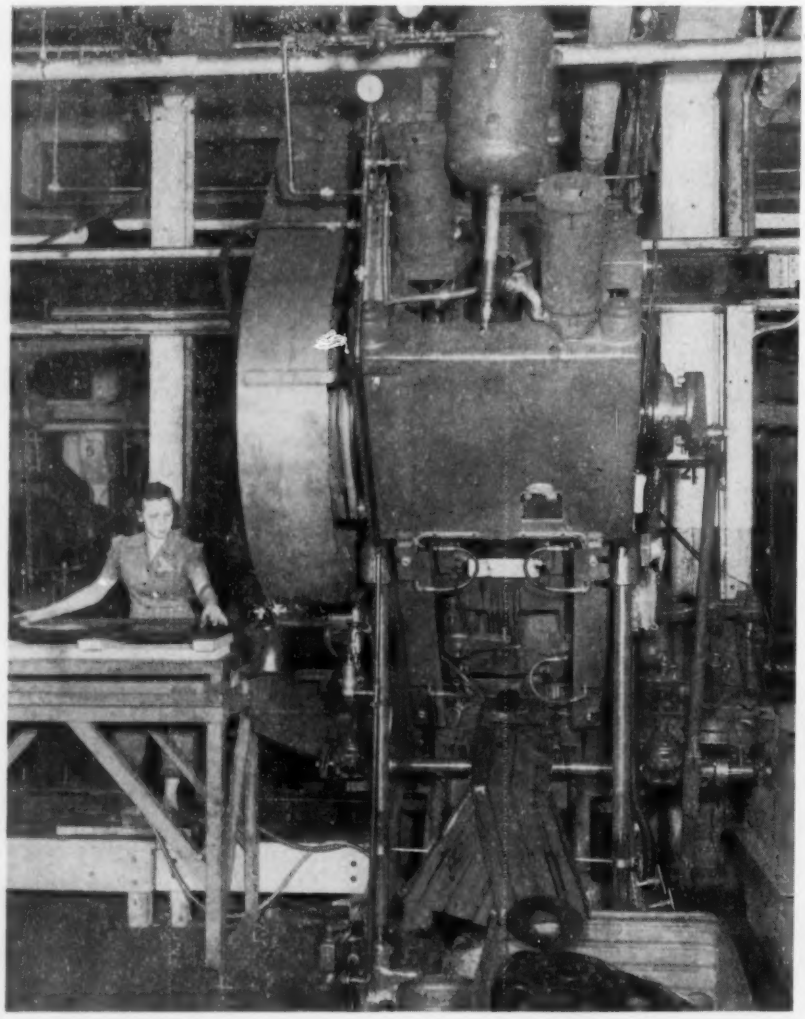
matic setup for welding a combustion chamber for a jet engine.

Heliarc Welding — The Heliarc welding process of The Linde Air Products Co. is one of the most versatile methods for welding sheet or plate because of the accuracy with which intense heat may be applied to a very localized zone. In this method, an inert monotomic gas, such as argon or helium, is used to prevent oxidation in the weld metal. Generally a single electrode of tungsten is used, but carbon electrodes may be substituted if proper care is taken to prevent carbon absorption in the weld metal. Both alternating and direct current arcs may be used for joining, although straight polarity direct current is preferred. When alternating current is applied, a high-frequency current should be used to simplify initial striking. Mechanical welds can be made without difficulty, and clean, smooth welds are possible without the aid of flux.

Oxyacetylene Welding — The oxyacetylene process, with certain limitations, can be used for welding the high-temperature alloys; but, in general, the faster and carbonless arc methods are preferred. The chief disadvantages in using the oxyacetylene process lie in the danger of precipitation caused by holding the metal at too high a temperaure for too long a period of time. Then, too, there is always a possibility of carbon absorption in the weld area caused by excess acetylene in the gas mixture.

However, neither of these difficulties is insurmountable. Precipitation and carbon pickup can be controlled through the use of special fluxes and by proper blowpipe operation. When welding with the oxyacetylene process, you can obtain best results by using a neutral flame and a blowpipe tip several sizes smaller than ordinarily used for joining plain steel. Oxidizing flames should never be used.

From data presented by the author before the 28th annual meeting, AWS, Chicago, Oct. 21.



SEMI- TO FULL AUTOMATIC: Installation of all-electric, adjustable speed drives, products of Reliance Electric & Engineering Co., Cleveland, on three of its newest inclinable punch presses, trebled the output of rotor and stator laminations used in manufacture of electric motors. Presses, made by Minster Machine Co., Minster, O., were changed from semiautomatic to automatic operating cycle. Using the same dies and material, they have a range of strokes per minute of 30 to 120

Handbook on Synthetic Rubber Available

Design, manufacturing and on-the-spot check-up experience with synthetic rubber packings is incorporated in a recently published 112-page handbook on synthetic rubber packings. The illustrated book is said by E. F. Houghton & Co., Philadelphia 33, its sponsor, to be a complete authority on the application and design of the packings of all types, both fabricated and homogeneous.

Many of the products discussed were developed during the war and are still in great demand, both by the armed services and industry, because of the ability to withstand temperature extremes at low pressures. Fabricated packings have a temperature range from 0 to 700° F at pressures up to 6000 pounds per square inch. Homogeneous packings are said to be usable from sub-zero to 250° F at pressures up to 3000 pounds per square inch for motion and up to 15,000 pounds per square inch for nonmoving or static installations.

Over 30 engineering drawings and numerous photographs illustrate the handbook which is available from the company by request on company letterhead.

Over 600 Articles Listed In Welding Bibliography

Electric Resistance Welding Bibliography, by Harold S. Card: 22 pages, 8½ x 11 inches; published by Harold S. Card, 850 Euclid Avenue, Cleveland 14, Ohio, for $2.

Titles, authors and publication dates of 646 articles on resistance welding subjects which have been published in 49 technical and industrial magzines from January, 1936 to June, 1947 are covered in this publication. Most of the titles have topical synopses indicating the scope and subject matter of the articles. Each title is given a key number by which the entire list is indexed under 133 subject headings. Lists of current standards publications and books and booklets are included.

urning the tables—

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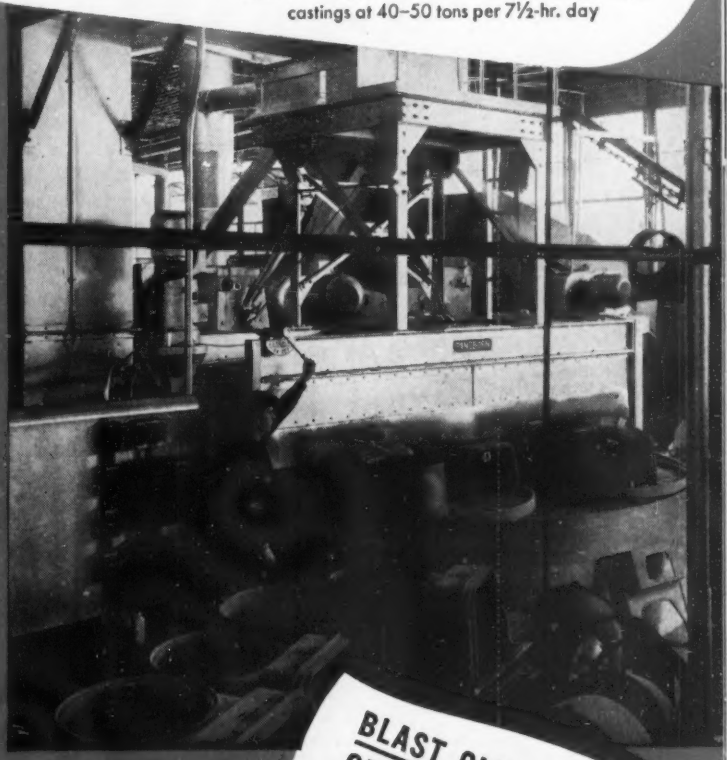

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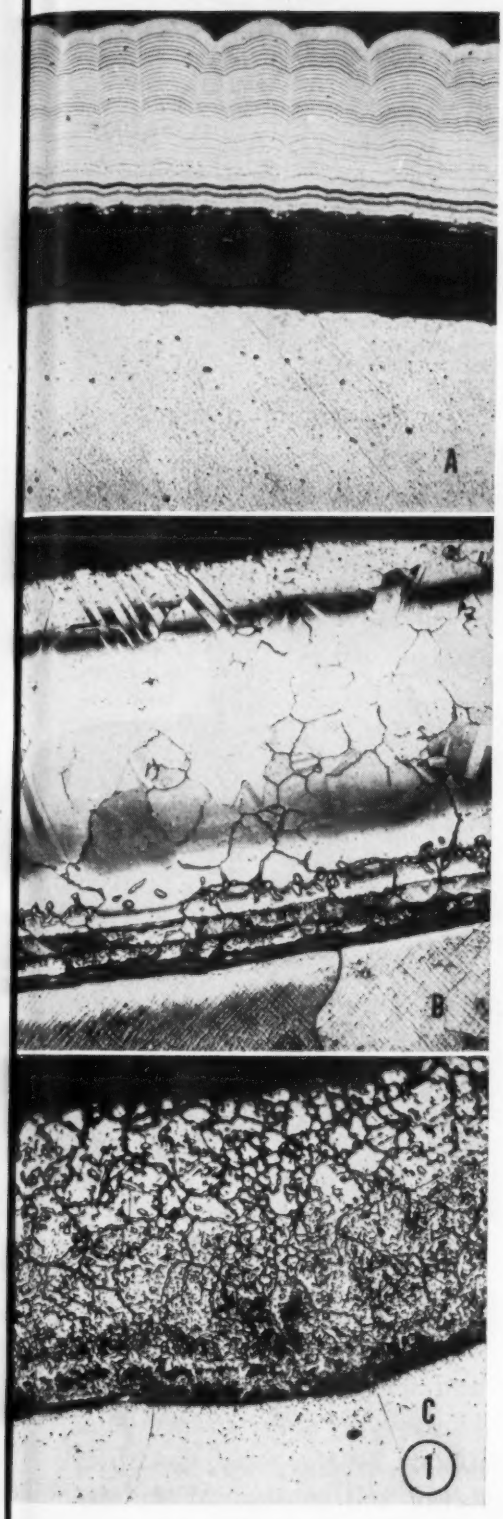


Electrodeposition of Tungsten Alloys

On Metal Surfaces

Process developed by National Bureau of Standards deposits thick, smooth coatings that retain hardness at elevated temperatures

METHOD of producing satisfactory electrodeposits of tungsten alloys on metal surfaces resulted from investigations conducted by the National Bureau of Standards, reported in technical report 1152. Smooth, thick deposits of tungsten alloyed with cobalt, nickel, or iron were obtained from hot ammoniacal solutions containing organic acids. These alloys are quite hard and retain their hardness at elevated temperatures, just as do the similarly constituted cast metallurgical alloys.

Commercial importance of tungsten alloys is directly related to their use in application such as bearings, pistons, cylinders, dies, molds and machine tools, where hardness, corrosion resistance, or high strength at elevated temperatures are essential. Although efforts to electrodeposit pure tungsten have for many years proved unsuccessful, deposits of this metal alloyed with iron, nickel, and cobalt, have been produced by various processes.

These methods, however, yielded specimens having unsatisfactory physical properties for many uses. Only a thin layer could be obtained, and this was weak because of cracks and oxide inclusions. Development of an improved process for depositing these alloys was therefore undertaken by the National Bureau of Standards.

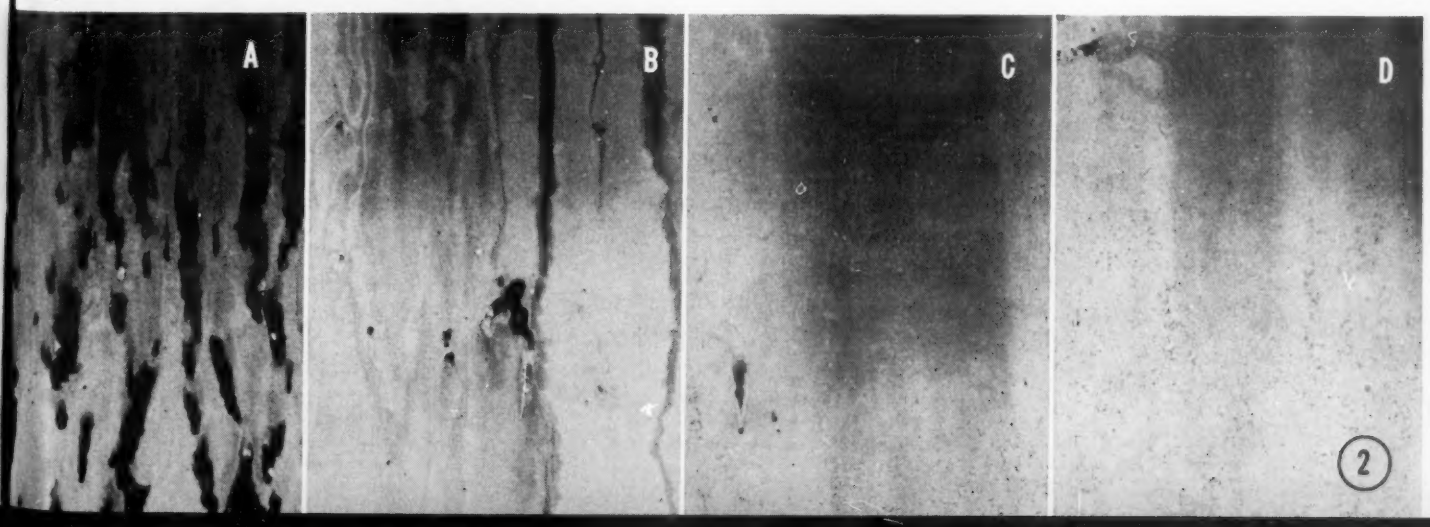
Of the alloys investigated, cobalt-tungsten was found to deposit most easily. In some of its properties it resembles the alloy Stellite. A typical solution for depositing cobalt-tungsten at the Bureau contains:

Tungsten 25 g/1 (as sodium tungstate)
Cobalt 25 g/1 (as cobalt chloride or sulphate)
Rochelle salt 400 g/1
Ammonium chloride 50 g/1

Ammonia to a pH of 8.5 to 9. Plating takes place at a temperature above 90°C and at a current density of from 2 to 5 amperes per square decimeter. The Rochelle salt may be replaced by

Fig. 1—Photomicrographs of tungsten-alloy electrodeposits obtained by new process developed at the National Bureau of Standards. A—Untreated iron-tungsten deposit, 48 per cent tungsten (250X); note laminations. B—Cobalt-tungsten deposit, 25 per cent tungsten, after heating to 1300° C for 15 hours (100X); note disappearance of laminations and appearance of grains. C—Same specimen after heat-treating at 800° C, showing precipitation

Fig. 2-A,B—Nickel-coated steel panels after 5 days' exposure to a 20 per cent saltspray test. C, D—Steel panels, with cobalt-tungsten coatings (20 per cent tungsten), after same treatment. Coatings in A and C are 0.00025-inch thick, while those in B and D are 0.001-inch thick



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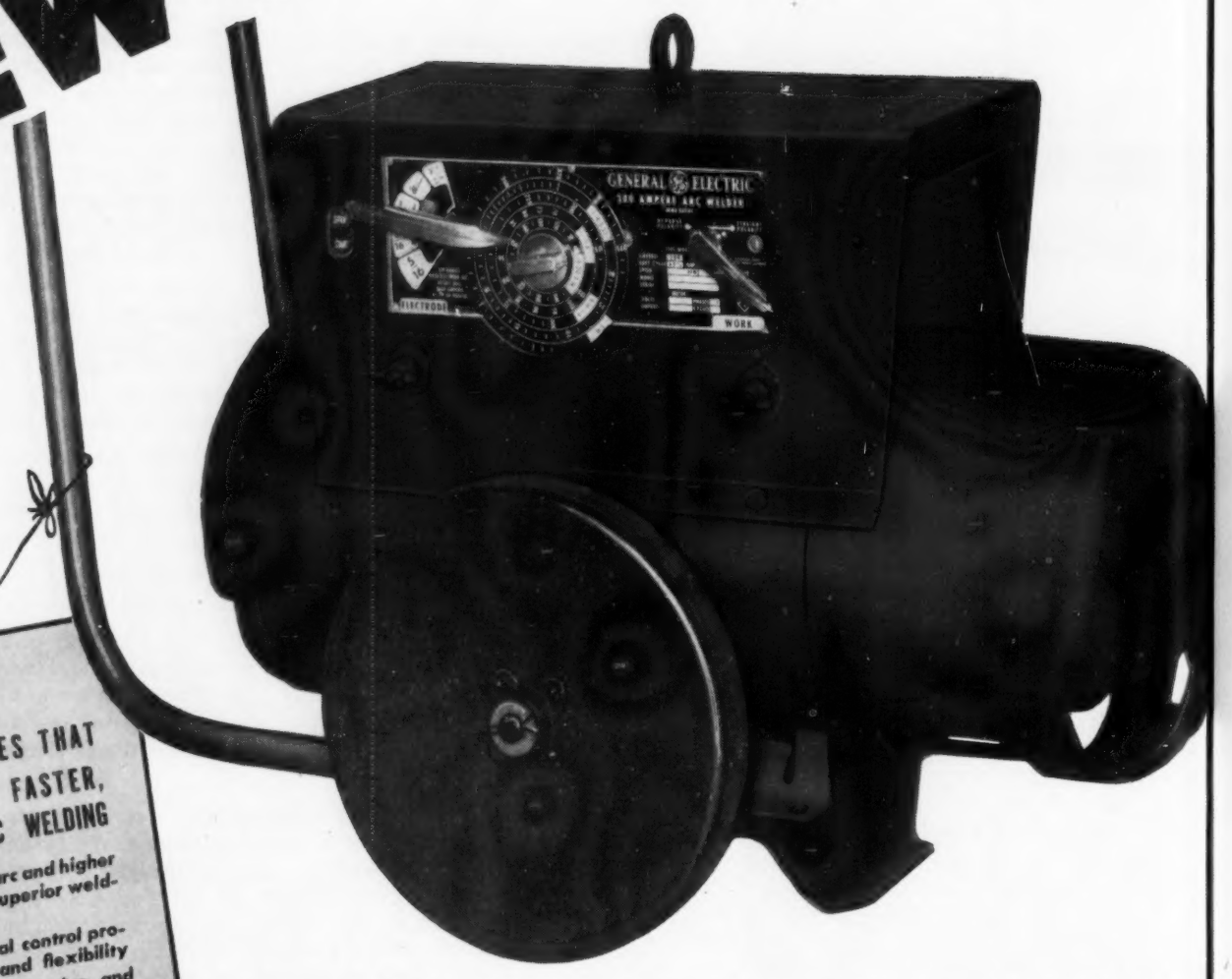

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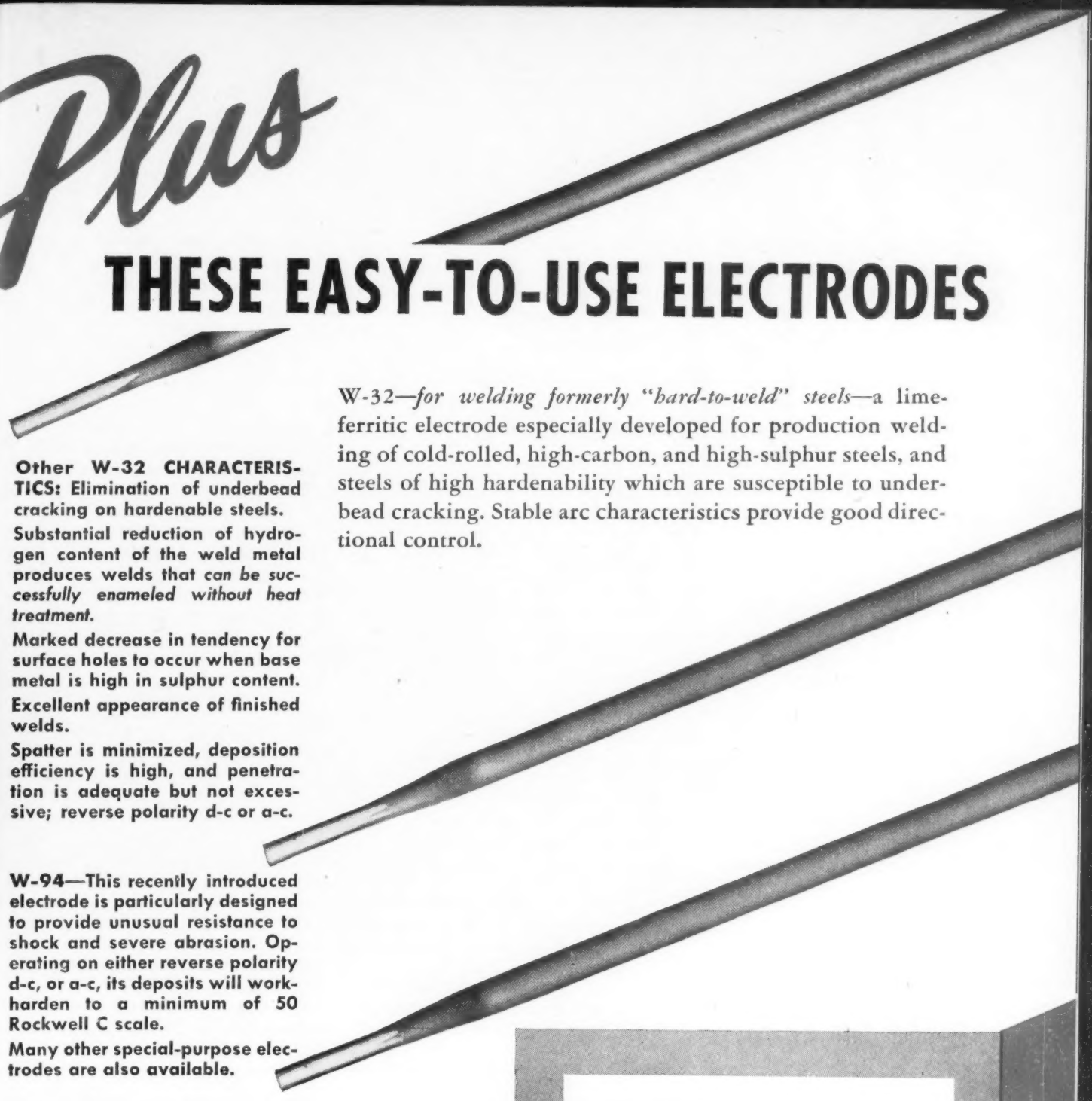

W-32—*for welding formerly "hard-to-weld" steels*—a lime-ferritic electrode especially developed for production welding of cold-rolled, high-carbon, and high-sulphur steels, and steels of high hardenability which are susceptible to underbead cracking. Stable arc characteristics provide good directional control.

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ARC WELDERS . . . ELECTRODES . . . ACCESSORIES

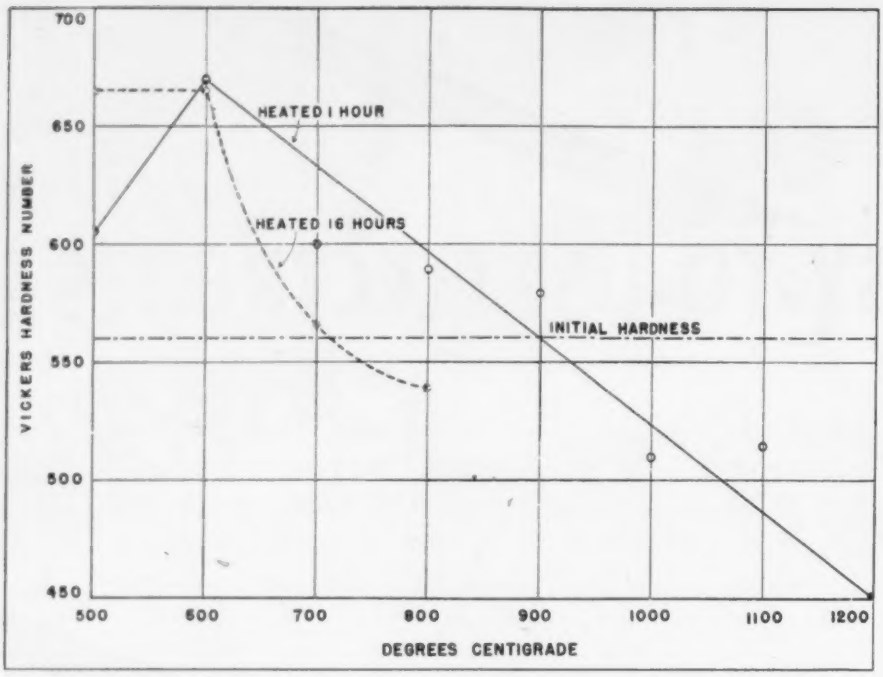


Fig. 3—Curves showing change in hardness of cobalt- tungsten electrodeposit when subjected to heat treatments at various temperatures

salts of other organic hydroxy acids. As anodes, either tungsten, the appropriate iron-group metal, or a tungsten alloy may be employed. Tungsten anodes leave the least amount of residue when they go into solution, and may be used without bags. The solutions for depositing the iron- and nickel-tungsten alloys are very similar to that given above.

Maximum percentages of tungsten that may be obtained in this way are 35 per cent in the nickel alloy, about 50 per cent in the cobalt alloy and about 60 per cent in the iron alloy. However, for sound alloys of desirable properties, the tungsten content must be lower than the maximum. For example, cobalt alloys should have not more than 30 per cent tungsten.

Nickel-tungsten and cobalt-tungsten deposits have good adhesion to steel and can be plated up to a thickness of 0.02-inch without becoming appreciably nodular. As formed, they are brittle and show a laminar structure under the microscope, but heating to suitable temperatures results in the disappearance of the lamination as the alloys become ductile.

Most interesting feature of the alloys obtained by this process is their hardness, which in the untreated nickel- and cobalt-tungsten alloys may be between 400 and 700 on Vickers scale. The iron alloy is still harder, ranging from 700 to 90 Vickers; it is thus comparable in hardness to electrodeposited chromium.

Unlike most other electrodeposits, which soften with heat treatment, these alloys may increase 100 points or more in hardness upon heating to 600°C. The cobalt-tungsten alloy is of further interest in that it maintains a fair degree of hardness even at quite elevated temperatures. For example, at 700°C the hardness of a carbon steel drops to about 50 Vickers, whereas the cobalt-tungsten alloy at this temperature has a hardness of over 290 Vickers.

Resistance of nickel-tungsten and cobalt-tungsten alloy to chemical attack is not much greater than that of either nickel or cobalt in the pure state, with the exception that they are much more resistant to nitric acid. In the salt-spray test, coatings of cobalt-tungsten alloy show less porosity and afford better protection to steel than do ordinary nickel coatings. However, the nickel-tungsten alloys are inferior in protective value to nickel coatings.

While tungsten alloys deposited from the solutions developed at the Bureau of Standards have not yet been utilized commercially, it is expected that they will find application on surfaces that require hardness and durability at elevated temperatures. Because of the excellent throwing power of the solutions, these coatings are more readily applied to irregular-shaped surfaces than is chromium plate. The electrodeposition section of the National Bureau of Standards will co-operate with those who are interested in plating small metal parts that can be subjected to a service test.

AC Lines Drive DC Motors By Two Types of Rectifiers

At least two ways of operating direct current motors on alternating current lines are at present being used on industrial drives. One is the controlled tube type rectifier for use with variable speed equipment when variable voltage is required; the other is the selenium type dry disk rectifier which furnishes a constant direct current voltage and which does not give as wide a speed range as the tube type.

According to Westinghouse Electric Corp., Pittsburgh, the selenium rectifier is being used for six sizes of 230 volt motors between 1 and 15 horsepower. All equipment—rectifier, controls, auto-transformer and fan to keep the stacks cool (in the larger sizes)—is housed in a small cabinet. This type of rectifier is said to bring about a significant saving in size and weight.

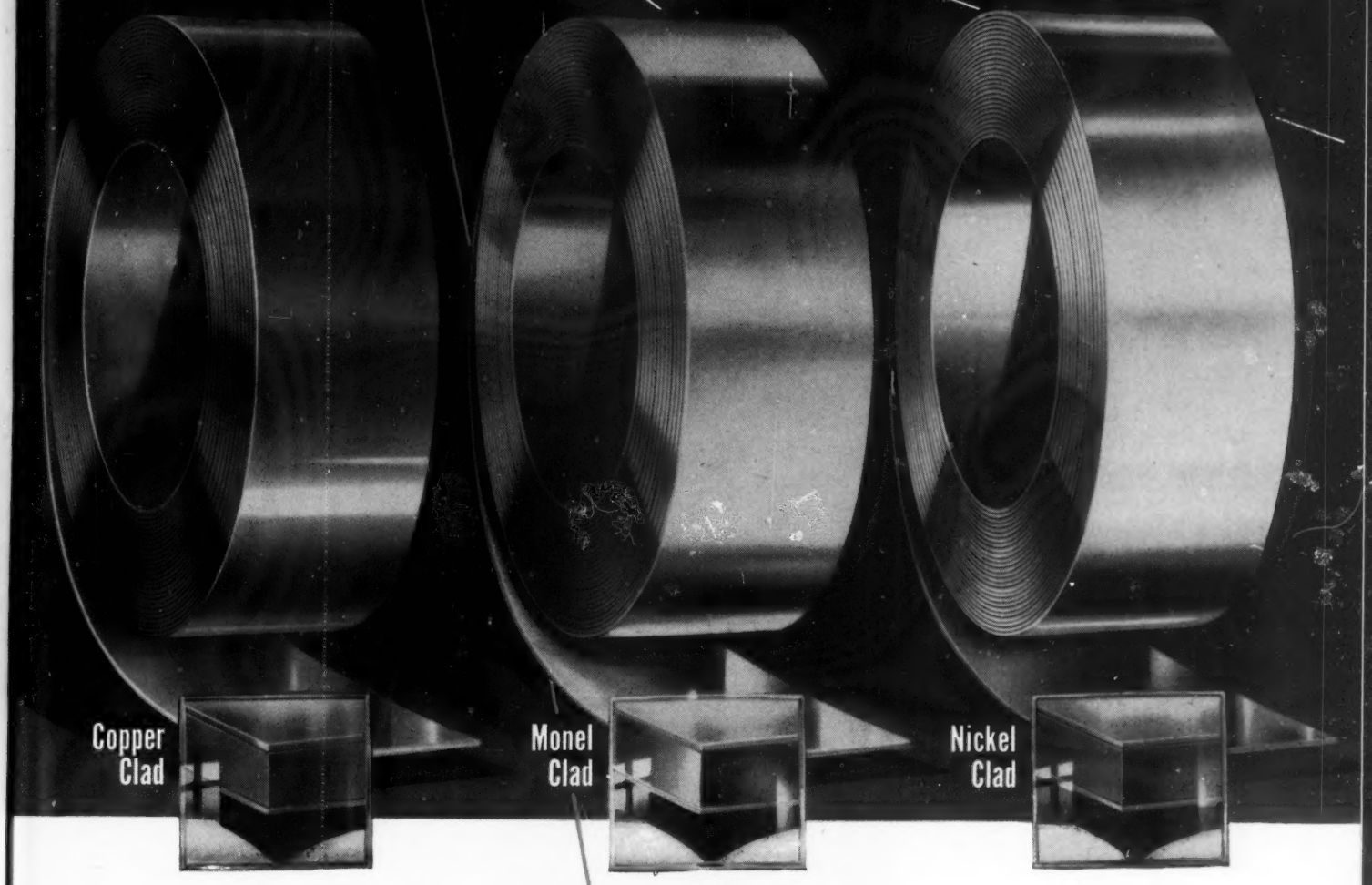
Called the Mototrol by Westinghouse, the tube type direct current motor control has been simplified since its introduction several years ago. A new use for this type of equipment is in steel mills to drive alloy strip through annealing furnaces and pickling tanks. Although the power requirements are small, speed must be adjustable and closely regulated over a wide range. Power supply and control equipment is contained in a small cabinet. The drive reportedly gives precise speed control over the 4 to 32 feet per minute speed range of the processing line and 2½ to 1 speed adjustment of the strip being wound up on the reel as it increases in diameter. By both field and armature control, a speed range of 20 to 1 is obtained, the company states.

Nylon Enables Gage To Resist Vibration

Ability to withstand severe pulsation and vibration has been incorporated into the Ashcroft Duragage, made by Manning, Maxwell & Moore Inc., of Bridgeport, Conn., with the use of du Pont Nylon in the gage movement. Said to be the first such application, the material reportedly has a low coefficient of friction, high resistance to shock loading and high corrosion resistant properties.

Here is the range of

versatility



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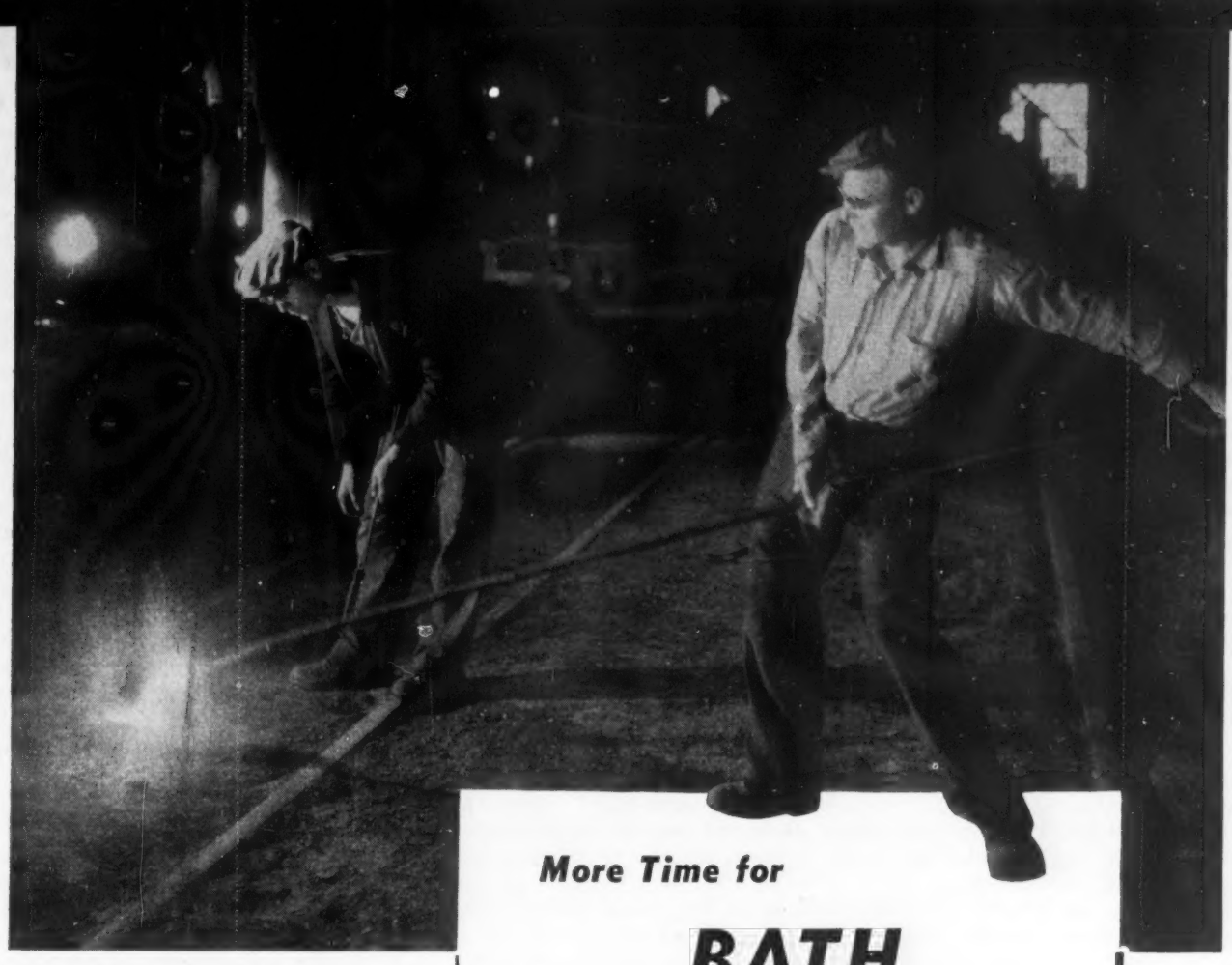


Spoon sample of open-hearth steel being poured into mold box

More Time for

BATH ALTERATIONS

. . . provided by use of Spectrograph in steel plants

Instrument permits one processing of test sample thus allowing more time for the melter to alter the furnace or ladle additions, or the sizes of molds into which the heat is to be poured. Speedy technique is employed on basic iron, open-hearth slags, or fully-killed, deep drawing steels

By B. W. BOWEN
Spectrographic Laboratory
Republic Steel Corp.
Cleveland

PRODUCERS of open-hearth steels have long been aware of the presence of a good many elements other than iron in their various grades of steel. However, if a sound, clean heat of steel was made and rolled satisfactorily, and it suited the customer as to quality and chemistry, there was obviously no necessity for concern about copper, tin or other components.

Many developments have conspired to force steelmakers to determine the amount of other elements in the bath besides carbon, manganese, phosphorous and sulphur. Foremost are the ever-increasing requirements of automobile makers, fabricators of welded structures, producers of automatically forged and stamped parts and many others. More practically, the situation can be summarized by saying that technological advances have extended the inherent average physical properties of steel much closer to its limit. To obtain that last degree of ductility, or weldability, without sacrificing a pound of strength, melters, chemists and metallurgists must see to it that some elements encountered in the bath are kept out and others are kept in.

Chief offenders among the nonferrous metals contaminating the bath are copper, tin, lead, arsenic and zinc. In addition, nickel, chromium, molybdenum and vanadium, which alloy with iron to improve its physical properties, are often not desirable to have in the bath. All of these elements are encountered in steel scrap in erratic and unknown amounts. Indeed, some scrap containing a beneficial amount of copper or nickel for that grade, may contaminate another heat beyond the allowable limit. Hot metal from the blast furnace also contributes a limited amount of undesirable elements, depending chiefly upon the kind and amount of turnings and borings in the burden.

Development of the spectrograph in the last 10 years has made it a versatile means for quickly inspecting the bath for residual amounts of nonferrous metals. In addition to providing a fast analysis of the two or three elements most liable to contaminate the bath, the spectrograph can simultaneously determine the presence of elements less frequently encountered,

but just as undesirable if present. This is made possible by the fact that different atoms produce spectra characteristics only of themselves. It remains only to identify the various spectra and measure their relative densities to determine the amount present.

Speed in obtaining all of the potentially undesirable elements in one processing of the furnace sample is important because it affords the operator more time to make changes in furnace or ladle additions, or in mold size, which would become necessary should excessive contamination of the bath be found. A questionnaire on preliminary tests was submitted in 1946 by the Open-Hearth Committee, A.I.M.E., to 40 steel plants. Replies of half a dozen mills employing spectrographic analysis for these tests indicated an average overall time of 25 minutes for determination of four or five elements. The actual average analysis time was slightly under 20 minutes.

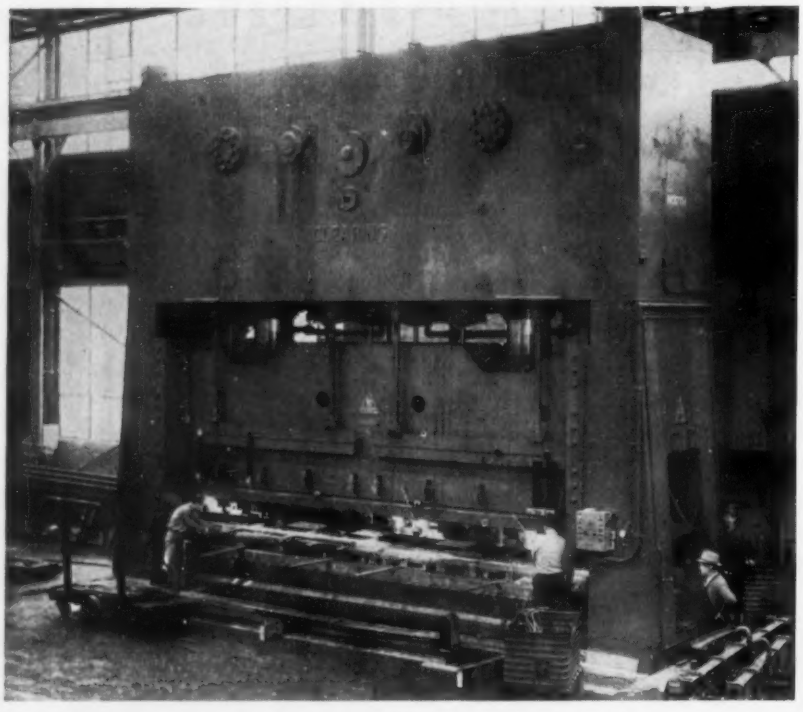
This time is cut to 5 minutes by the new direct - reading spectrometer which will be described later.

Preliminary analysis for alloy content is also advantageously done by spectrograph, particularly if no chemical check is necessary and the chemical process is slow. However, in many plants where a 1.00 per cent alloy content is involved, both methods are usually used as checks on each other. Electric furnace practice commonly employs spectrographic results only on the melt test, and both methods together on the preliminary and final analyses.

After all this testing and adjustment for final composition, the heat is poured and a pattern of ladle tests is analyzed to judge the heat's applicability to intended use. At this point, find out how good the preliminary analyses are for their value is directly related to the quality of the sampling procedure and the ensuing furnace practice. Spectrochemical analysis of ladle tests is of great value because it can in most cases be adapted to the elements which are difficult and quite tedious to determine chemically.

Determination of aluminum content in fully-killed deep-drawing steels was the first "finished product" analysis taken over spectrographically at Cleveland, because of reasons such as manpower, the time factor, and practicability.

It was subsequently developed so that an aluminum value could be reported soon after the heat was poured. This control is not only helpful but critical for the proper metallurgical application of this product and could not be accomplished previously when chemical or spectrographic analysis was belatedly made on a test sheared from the rolled product. Silicon contents of semikilled steels also proved to be a field where spectrograph methods saved time, money and materials, and was a welcome replacement for the tedious wet chemistry method which was necessary to obtain the desired accuracy. Spectrochemical results on copper, molybdenum, nickel and silicon are also reported in our plant up to 2.0 per cent of content. However, in the range of 1.0 per cent and over, most plants substantiate at least a part of the spectrograph values by wet chemistry. Digressing from steel for a moment some of the related materials of the industry are considered.



MODERN PRODUCTION GIANT: Thirty-three-foot side rails for busses, trucks and trailers are stamped out in one stroke on this huge press recently installed in the plant of Midland Steel Products Co., Cleveland. Believed the largest unit designed for automotive parts manufacture, the press—built by Clearing Machine Corp., Chicago—is capable of exerting eight strokes per minute at a ram pressure of 3000 tons. Base of the press was sunk 15 feet below the level of the floor to bring the height of the dies to convenient level of operators

Method Has Various Uses

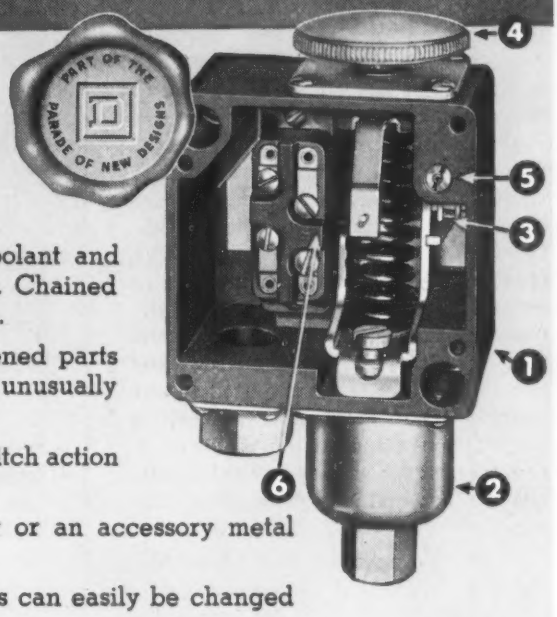
Analysis of basic iron for silicon, manganese, copper, nickel and chromium has been found well suited to spectrographic methods. In this field, results are sufficiently accurate to do the job. Other steel plant analytical problems also are wide open to the speedy technique offered by the spectrograph. Foremost of these is a quick determination of lime-silica ratio in open-hearth slags. Moreover, it is possible to calculate a complete slag analysis in a somewhat longer time and thus obtain a corrected "V" ratio after a formula such as that of Chipman and Winkler. Blast furnace slags also have been adequately analyzed, as have ferrosilicon, zinc and tin for plating purposes, and others. Most of these have either been described in publications or have been heard of privately.

In order not to become over-zealous, there must be some confinement as to what is analyzed, especially if only one spectrograph is used. A full understanding of the limitations of a spectrograph in relation to all the dissimilar materials previously mentioned, is had by comparing it with the equipment of a small chemical laboratory where the balances, beakers, standard solutions and distillation apparatus have been set up for routine iron and steel analysis. Visualize the problems which would arise should this laboratory be expected to analyze coals, or coke plant by-products, or raw materials like limestone.

The end result, of course, is an impossible strain on the available space and tools beyond their limit

NEW Pressure Switch Designed for Machine Tool Service

These Construction Features Make it a Better Pressure Switch for Machine Tool Applications:



1 ENCLOSURE: Gasketed, die cast construction is oil, coolant and moisture tight. Mounting holes are sealed by cover gasket. Chained cover has self-retaining screws. Conduit hub is detachable.

2 MECHANISM: Bellows are heavy wall, seamless. Hardened parts and short travel characteristic of operating mechanism insure unusually long mechanical life.

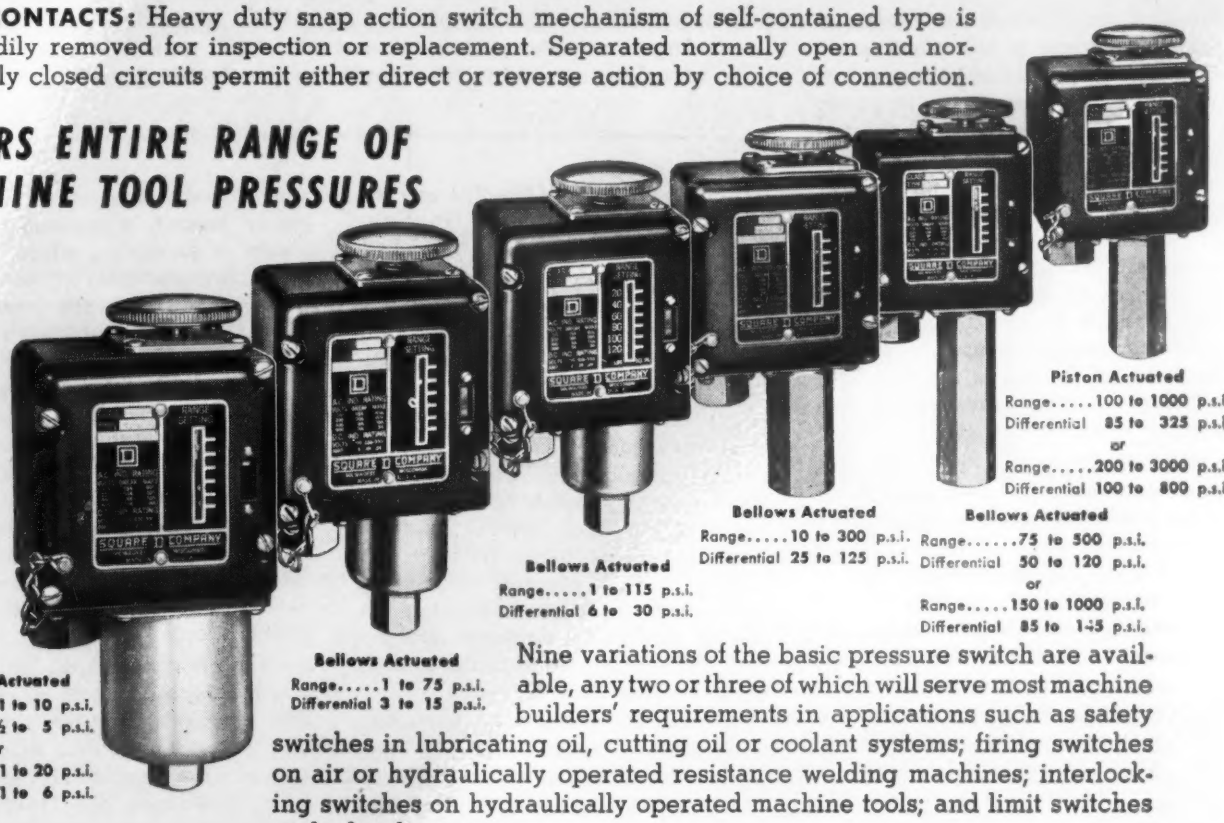
3 INDICATOR: Lever motion permits easy observation of switch action through window in cover, to assist in proper setting.

4 RANGE: Settings, externally adjustable by screw driver or an accessory metal knob, are indicated on scale.

5 DIFFERENTIAL between "cut-in" and "cut-out" pressures can easily be changed by a set-screw adjustment accessible with cover removed.

6 CONTACTS: Heavy duty snap action switch mechanism of self-contained type is readily removed for inspection or replacement. Separated normally open and normally closed circuits permit either direct or reverse action by choice of connection.

COVERS ENTIRE RANGE OF MACHINE TOOL PRESSURES



Bellows Actuated
Range..... 1 to 10 p.s.i.
Differential ½ to 5 p.s.i.
or
Range.....1 to 20 p.s.i.
Differential 1 to 6 p.s.i.

Bellows Actuated
Range.....1 to 75 p.s.i.
Differential 3 to 15 p.s.i.

Bellows Actuated
Range.....1 to 115 p.s.i.
Differential 6 to 30 p.s.i.

Bellows Actuated
Range.....10 to 300 p.s.i.
Differential 25 to 125 p.s.i.

Bellows Actuated
Range.....75 to 500 p.s.i.
Differential 50 to 120 p.s.i.
or
Range.....150 to 1000 p.s.i.
Differential 85 to 145 p.s.i.

Piston Actuated
Range.....100 to 1000 p.s.i.
Differential 85 to 325 p.s.i.
or
Range.....200 to 3000 p.s.i.
Differential 100 to 800 p.s.i.

Nine variations of the basic pressure switch are available, any two or three of which will serve most machine builders' requirements in applications such as safety switches in lubricating oil, cutting oil or coolant systems; firing switches on air or hydraulically operated resistance welding machines; interlocking switches on hydraulically operated machine tools; and limit switches on hydraulic presses.

Write for Bulletin 9012-A. Square D Company, 4041 N. Richards Street, Milwaukee 12, Wisconsin

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of flexibility. Likewise, the spectrograph has a limit as to the variety of materials which can be accommodated when it is set up for routine iron and steel analysis 24 hours per day. They have, however, been improved as to flexibility, along with the increase in applications in which they may be utilized.

Production analysis by spectrograph, whether the new direct-readers or the older models are considered, is dependent to a great extent on the representative quality and ease of preparation of its samples. The shape of test commonly used is a pin of 1/4-inch diameter or less. This type requires some bath fluidity to obtain a good test, which at least is some safeguard against an early, unrepresentative sample, and, being chill cast, is relatively free from segregation. Various methods are used to obtain it: the metal may either be poured into a special pin mold, or it can be cast by any of several methods of suction into pyrex glass tubing.

The latter method is used at Republic's Cleveland laboratory for steel tests, the former for iron samples. A flat type of sample is preferred in some plants, and the undeniable advantage is the requirement of only one sample for both spectrograph and wet chemistry. However, a high-speed cut-off wheel is necessary to split the sample and the layout of the plant must allow speedy preparation and delivery. The whole problem of choice of sample shape revolves around the analysis requirements of each plant, the facilities for taking and preparing tests, and the type of spectrograph used. After all, the simplest method is the best if it will give accurate and reproducible results.

The term "simplest method" is a good description of the manner in which the new direct-reading spectrograph operates. A pin sample is halved, ground on the ends and inserted in the spark stand. The current is started and the operator is free for 30 seconds to record the heat number, etc. At a set time, the instrument shuts off and pointers on the several indicators revolve to positions on the dials which are read off directly in per cent. The sample pins then are reversed and in 35 seconds more a duplicate analysis is recorded by the instrument.

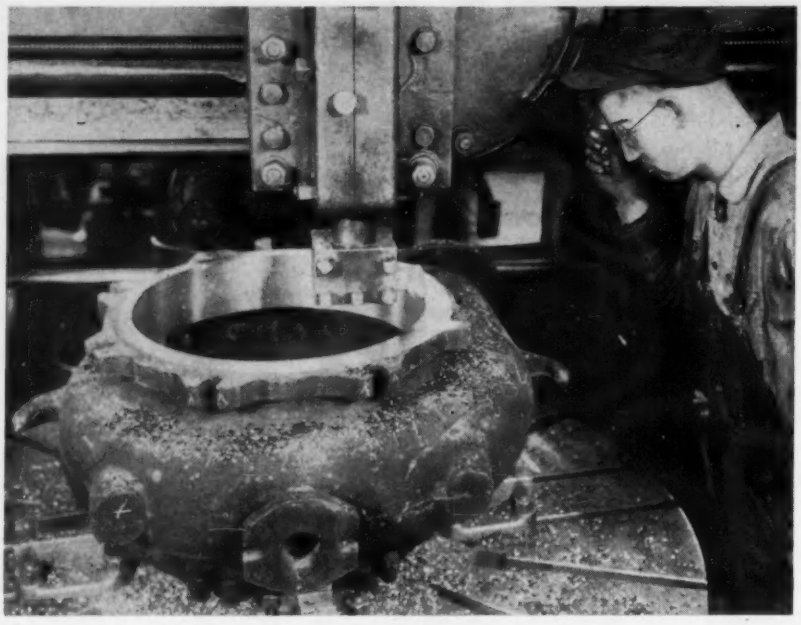
The foregoing is a description of an actual analysis made on a Cleveland sample by the Baird-Dow direct reading Spectrometer which Timken Roller Bearing Co. installed.

However, like any other instrument, it must be properly handled and its results constantly checked. It is the first instrument of its kind to be employed in routine steel analysis and the operators have, and no doubt will, encounter more difficulties as they gain experience in its use in the future.

The direct-reader, which is not a brand new idea, is simple in theory, merely employing light - sensitive tubes and condensers, which add up the light of the desired spectrum lines instead of using photographic plates. Then in place of painstaking line measurement, the condensers are merely allowed to discharge and record the analysis while in the process of discharging.

The development of direct-reading spectrographs was occasioned and promoted chiefly by the aluminum and magnesium industries. Ford Motor Co. operated one during the war in its magnesium foundry, and is now developing a unit for steel analysis using a Jarrell-Ash spectrograph. The Aluminum Co. of America has worked for years with Applied Research Laboratories and is now using at least three of this company's instruments, the Quantometer. The need for rapid and extensive analysis is just as urgently needed in secondary melting plants of aluminum alloys, where at times they analyze for 12 to 16 elements—and want the results in a short time. Iron and steel is handled in large and slower-moving tonnages so that the need for 5-minute analysis has not been acute (excluding preliminary carbon, manganese, phosphorus and sulphur, and slag FeO and lime-silica ratio). However, a 5-minute analysis means that the analyst is ready to run another sample in 5 minutes, a third sample in 10 minutes, etc., thus showing the labor-saving possibilities.

Counterbalancing all this is decreased flexibility and a greater initial expense. In other words, if the unit is set up for the 8, or 12 elements most desired for control, a quick look cannot be taken at the arsenic spectrum, for instance, or lead, unless it is included in the selected group of elements. Problems like this must be delegated to a conventional spectrograph or to wet chemistry.



"ROUGH" TOOL JOB: Mine pump casing shown here is being finished on a boring mill at the plant of Barrett-Haentjens & Co., Hazelton, Pa., with the aid of Carboloy tools. Rough cuts as heavy as 0.075-inch are made with a feed of 0.020-inch on the 20-inch bore of the pump casing. A speed of 5¼-revolutions per minute—equivalent to a 27½-foot per minute cutting speed—is employed. Finishing cuts are made to a depth of 0.015-inch with a feed of 0.020-inch. Speeds of about 16 feet per minute are used on such special cuts as turning a 45-degree angle on the face of the casing, or boring inside diameter. Casing is an alloyed, heat treated white iron with a brinell hardness ranging from 550 to 700. Photo courtesy International Nickel Co.

Paper presented at the annual meeting of the Southern Ohio Section, National Open Hearth Committee, A.I.M.E., Deshler-Wallick Hotel, Columbus, O., Oct. 31.

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Mechanized Scarfing

. . . conditions 4-1/32 x 5-3/16-inch billets at average rate of 125 feet per minute

SPEED and cost of conditioning steel for rolling are major production problems. Manual operation of the chipping dock where surface defects are removed by laborious effort is rapidly being replaced by mechanical scarfing equipment. In 10 years the tonnage of machine-scarfed steel has increased more than tenfold with improved design providing higher output at lower costs.

Confronted with mounting costs for billet conditioning, Washburn Wire Co., Phillipdale, R. I., is now operating a type CM-38 Lin-De-Surfacer scarfing machine and producing tonnage formerly requiring 50 hand chippers. The equipment is pulpit-operated by one man, billets $4\frac{1}{32}$ x $5\frac{3}{16}$-inch being surface-conditioned at a rate averaging 125 feet per minute. Depth of cut, which may be varied, averages $\frac{3}{64}$-inch, and all four sides are scarfed simultaneously.

Since first incorporated in steel mill roll lines, mechanized flame-conditioning equipment has improved steadily in design and efficiency, the Washburn mill unit reflecting the sum total in this progress. Although basic principles of flame-scarfing are the same, design and installation of machines require more or less individual engineering to meet specific mill circumstances. The machine is geared to the roll line and scarfed billets move directly to the rolls without further conditioning.

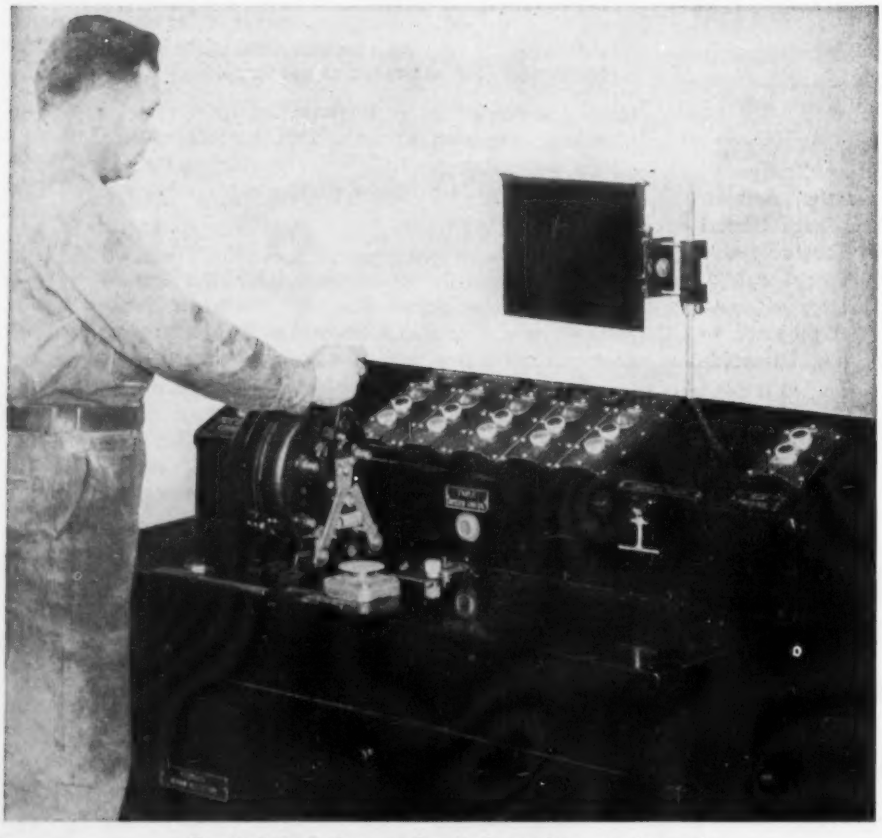
In the mechanized scarfing process, oxygen and acetylene are burned in postmixed nozzles. Preheating flames raise and maintain steel at kindling temerature. A flat, practically continuous stream of pure, dry oxygen is turned on after steel reaches the ignition point. The billet is moved at controlled speed beneath the nozzles and the oxygen applied progressively the entire length of the billet being desurfaced. Oxygen, combined with the steel, removes the surface metal and its defects to a predetermined depth, usually one-eighth inch or under. Depth of cut may be varied by changing the oxygen pressure or altering roll table speeds.

At rolling temperatures and at speeds fixed by rolling conditions, design provides flexibility for scarfing various sizes, shapes and steel analyses. Machine is instantly self-adjusting, horizontally and vertically, since billets and blooms are never truly straight; thus the engineering involved in mechanizing for flame scarfing is more than mounting multiple deseaming blow pipes over the roll table and passing steel under. This mill unit is a production machine designed to desurface four sides of billets at once; it weighs approximately 9 tons with accessories.

Main frame includes a bed plate on which are mounted two vertical pedestals, the latter guiding and supporting the floating cross-member unit to follow the usual horizontal or vertical camber in the billet. The entire cross-member floats 1½ inch each side of the center line and vertically approximately two inches above and below the normal position. After disconnecting the hose from the gas panel, the cross-member assembly can be readily raised from the pedestal and above the roll table for servicing. In some cases it is unnecessary to disconnect the supply hoses when raising this cross-member. Vertical scarfing units float therefore 2 inches above and 2 inches below the rolling table and the horizontal positions are 1½-inch each side of center. Simple compact design of desurfacing units incorporates all six nozzle selection ports in a single selector valve casting.

For various size billets, 2 x 2 inches to $7\frac{5}{16}$ x $7\frac{5}{16}$-inches, changes to compensate may be made manually in about 20 minutes. The scarfing unit contains postmixed gas nozzles and a simplified gas distributor manifold with pistons for nozzle selection. When not operating the machine has a clearance of $14\frac{5}{16}$ x $21\frac{1}{4}$ inches, overall length is 12½-feet, height 15 feet, with opening in the roll tables 5 feet, 2 inches. There are 24 slotted postmixed No. 30 nozzles and four nozzle heads, six nozzle scarfing units per setup.

While the minimum length of steel that can be scarfed is generally recommended at 12 feet, with pinch rolls 8 feet is possible. The Washburn mill unit has pinch rolls. Electrical supply requirements are 230 volts direct current; 115-220 volts alternating current three phase. Smoke removal system capacity is 10,000 to 24,000 cubic feet per minute. Water



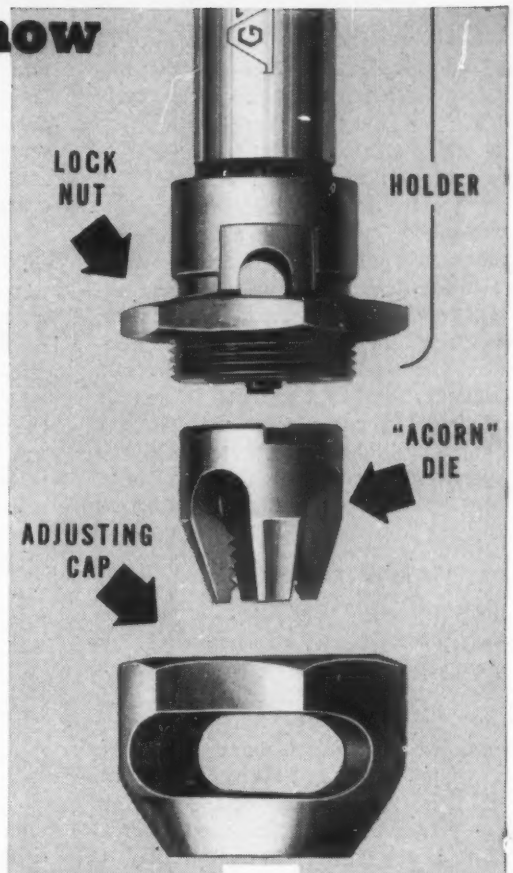
Control desk for mechanical scarfing equipment

A Few Facts You Should Know About "Acorn" Dies

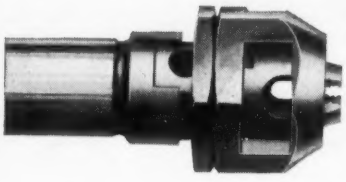
SIMPLE CONSTRUCTION • EASY TO OPERATE • FACTORY TESTED

To understand the operation of the "Acorn" Die, one should see it in relation to the "Acorn" Die Holder as pictured at the right in sectional view. The feature which makes the "Acorn" Die so convenient and accurate is the manner in which the four prongs or threaded lands are compressed when the holder cap is screwed down onto the holder. As all bearing surfaces on the holder and die are ground to insure correct alignment and accuracy, even pressure is brought to bear on each of the prongs simultaneously so that they all adjust equally and concentrically. This is done quickly and automatically by tightening the cap and turning up the lock nut. No other adjustments are necessary.

A positive adjustment to size can be obtained by using the threaded plug which comes with every "Acorn" Die. This plug has actually been threaded by the die in which it is shipped and has been carefully checked for accuracy. Thus, if it is used as a setting plug, accuracy of the set up will be assured. *For close to shoulder work, quick change over of jobs, accurate threads, specify "Acorn" Dies to your local Greenfield Distributor.*

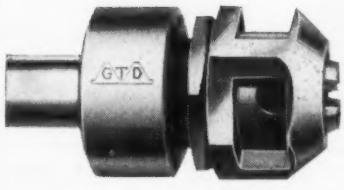


HOLDERS ADAPT "Acorn" Dies FOR ANY MACHINE



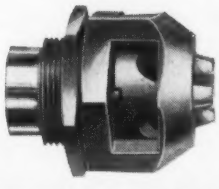
REGULAR

Regular "Acorn" Die Holder with longitudinal float which allows the die to follow its own lead independent of any lag in the machine. This holder may be used on practically all automatic screw machines and any other machines which provide for automatically reversing the die or rod at the instant when the desired length of thread has been cut.



RELEASING

Releasing "Acorn" Die Holder, while suitable for all machines, is especially recommended for hand operated machines. The improved clutch mechanism allows the holder to be released without shock.



ADAPTER

The "Acorn" Die Adapter permits the use of "Acorn" Dies with existing round die holders. It consists of three parts, a Cap to hold and adjust the die, a Lock-Nut to secure the adjustment and a Body. The shank fits round or spring die holders of corresponding size.

GTD Greenfield 75th YEAR

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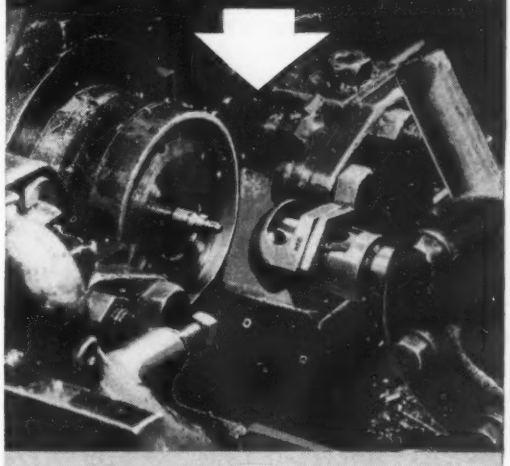

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and its New Haven Division The GEOMETRIC TOOL COMPANY

requirements for slag and cooling are 360 gallons per minute at 75 pounds per square inch or 600 gallons at 40 pounds per square inch.

Scarfing cycles average around 50 seconds, although the depth of cut, roll table speed and individual mill equipment installations make this variable. Typical for a $\frac{1}{16}$-inch removal: 1—position billet, five seconds; 2—close desurfacing units around billet, 3 seconds; 3—preheat, 5 seconds; 4—desurface, 64 to 115 feet per minute, 33.4 seconds; 5—retract units, 3 seconds; total 49.4 seconds. Of course, desurfacing period varies with the length of billet being prepared. This cycle has been bettered frequently at the Rhode Island mill, depending on the cut and work size scarfed.

Flashbacks Eliminated

Continuous production of molten slag ahead of the reaction zone, the quantity depending on the size of the billet and depth of cut, falls by gravity into a chute where high pressure water sprays drive it into a slag pit. Water sprays are also used for cooling parts of the machine subjected to heat, smoke removal hood and parts of the roll table.

Cascade storage system is used for oxygen, the company generates its own acetylene. Postmixed gas system eliminates flashbacks and the multiple hose connections outside earlier scarfing machines are absent, being centered in the nozzle block. Not only carbon steel is machine-scarfed at this mill, but also stainless and other alloys. Operating control is largely automatic with control desk, gas panel, electric panel and water cooling system requiring the attention and efforts of but one operator.

At the Washburn mill reheated billets are rolled; direct rolling eliminates several operations formerly required. Scarfing machine operates four times as fast as hand-scarfing and since the equivalent of 40 passes simultaneously is possible, mechanical conditioning is frequently 100 to 150 times faster. As steel can be mechanically scarfed at rolling temperatures, grades and analyses that can not be conditioned without being preheated for metallurgical reasons, can readily be hot-scarfed. Savings in conditioning costs range up to $4 a ton in some cases.

Germans Use Aluminum For Sheathing Cables

Aluminum replaced lead for sheathing relatively large signal cables in the practice of the German aluminum fabrication industry, according to report PB-78274, published by Office of Technical Services, Department of Commerce, Washington 25, D. C. German success in substituting aluminum for lead for this purpose is based not on new machine designs, but on the fact that the resistance of aluminum to plastic deformation decreases as the purity of the metal increases.

Even with the metal of 99.99 per cent purity (attained by the Germans), the extrusion temperature had to be increased to 450°C (twice that of lead) and this increased the likelihood of damaging the insulation. For this reason continuous extrusion, used with lead, was not used. Instead a preheated aluminum ingot is placed in the press and extruded, making the maximum single length of cable that can be made limited by the size of the ingot.

Also covered in the report is the technique used in the recovery of aluminum from scrapped aircraft, removal of magnesium from aluminum, melting practice, ingot casting, tubing, forging, collapsible tubes and impact pressings, foil manufacture, etc.

—o—

Steel, chromium and nickel "nails" were used by the Germans as internal splints for both simple and compound fractures of the long bones of the extremities according to a report on German medical practice and research offered by Office of Technical Services, Department of Commerce, Washington, D. C. A description of the type of nails is given in the report, designated as PB-498. German Aluminum Refining.

RESORTS TO BATTERY POWER

. . . in mass-welding phonograph turntables

IN a plant built 5 miles from the nearest power substation, Precision Mfg. Co. of Bergholz, O., is fabricating phonograph turntables by a process requiring the services of high production welders—a feat which probably could not have been attained before the war, considering that the company is allowed an electric line load of only 15 kilovolt-amperes. As the necessary heavier load would cause serious flicker and voltage drops in the community nearby, the company, a division of Alliance Mfg. Co., Alliance, O., resorted to operations using two press type battery-operated resistance welders.

Using several drawing and stamping presses and some spraying equipment in addition to the welders, the company is manufacturing turntables by the thousand per day during two shifts. Only current needed to keep the welders, made by Progressive Welder Co., Detroit, in operation 16 hours per day is a maximum of 30 amperes on a 220-volt line to operate a standard 3-phase package type battery charger.

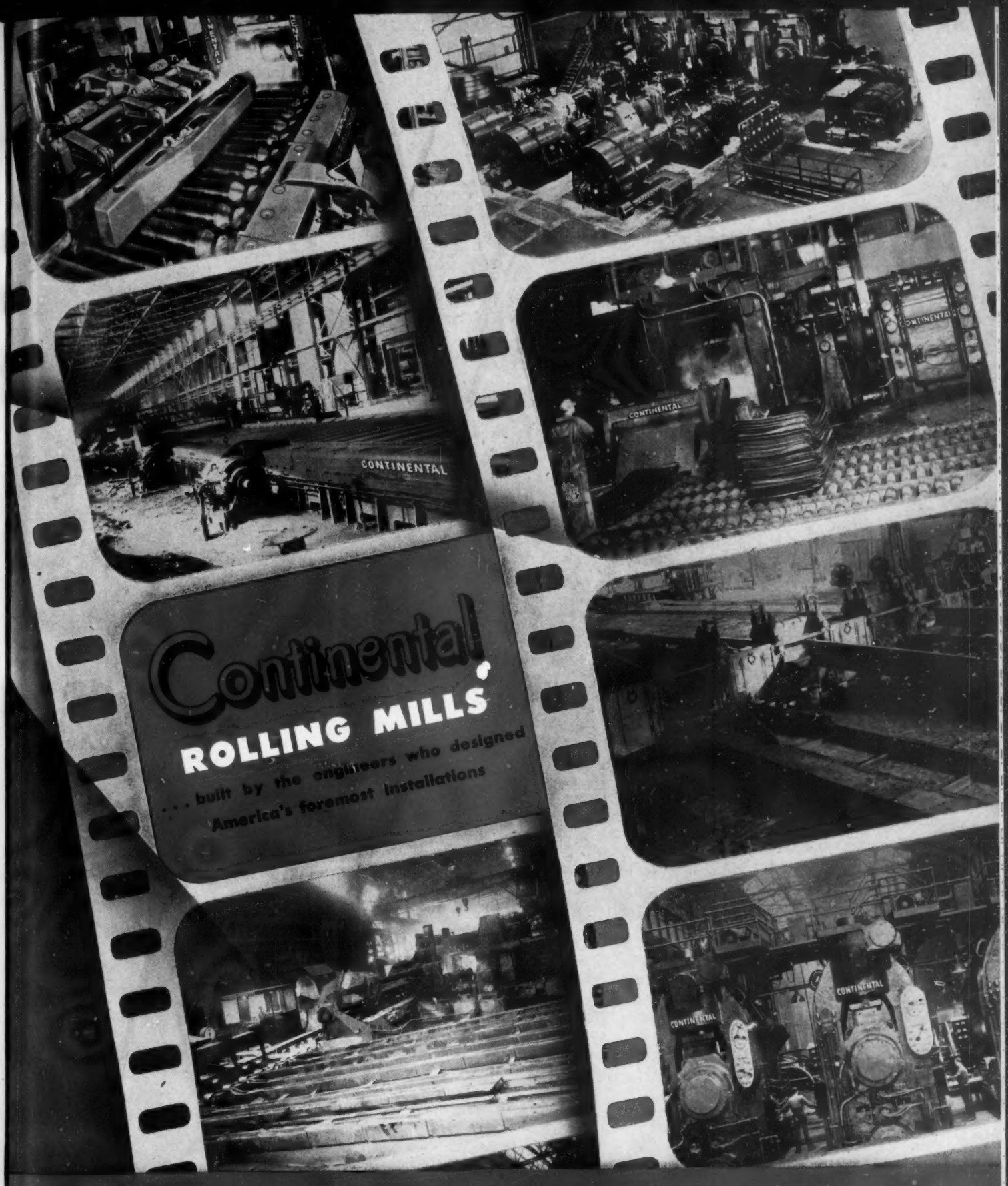
Use Same Processing Techniques

Although no two types of turntables produced are the same, the same production processes are used on all types as the major differentiating feature is in the mounting bracket. On a standard turntable are four different brackets, all welded to the turntable in one welding operation. The drawn and punched turntable is placed over the bracket in the lower die of the welder, the machine head brought down and battery current is turned on automatically through a contactor controller to form six welds simultaneously at the projections on the brackets.

Standard press type projection welders are used, equipped with watercooled storage batteries and carbon disk type contactor. A weld sequence timer causes the machine to press the parts together for 1 second, hold the welding current on for ⅓-second and then hold the parts under pressure during cooling for ½-second. At the end of the cycle the heat lifts for removal of the completed assembly.

Eighteen-gage steel is used throughout the manufacture of the turntables. Rejects are said to be negligible. The company makes an inspection of weld quality twice a day by attempting to pry the brackets loose from the turntable with a chisel.

Battery powered welders have made unnecessary the installation of heavy conductors to carry high welding current, expensive power line installation and other equipment. Feeders to the battery chargers are only No. 12 wire.



Continental

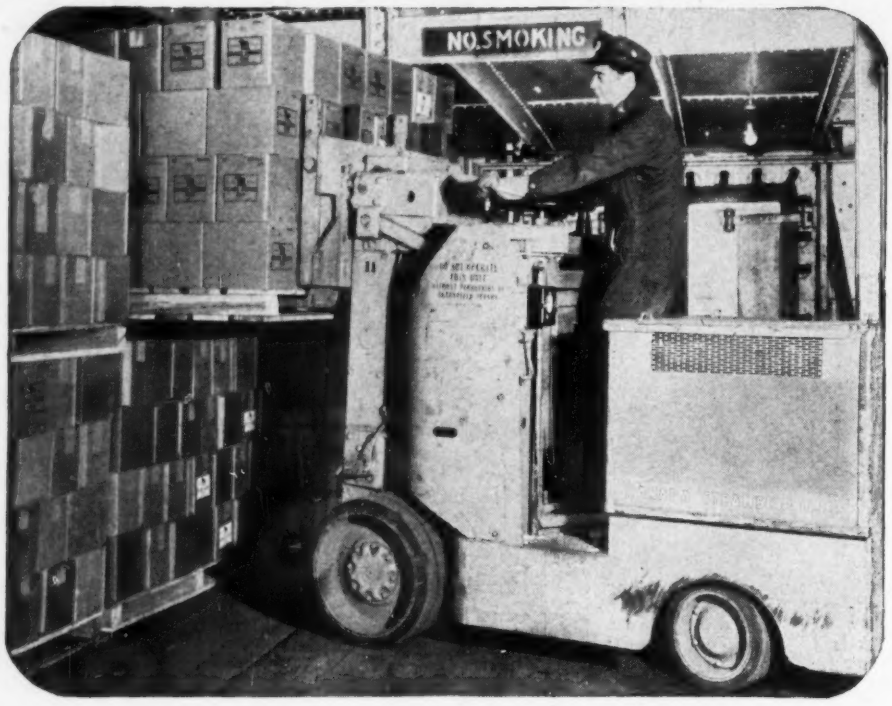
FOUNDRY & MACHINE CO.

CHICAGO · PITTSBURGH

Plants at East Chicago, Ind., Wheeling, W. Va., Pittsburgh, Pa.

Industry's Headquarters for Carbon and Alloy Steel Castings Rolling Mills and Equipment Iron and Steel Rolls

Use Battery Trucks for SAFE *handling*



. . . and Low-Cost Power

One of the outstanding advantages of battery industrial trucks for material handling is their inherent safety. Because they give off no fumes and are practically free from fire hazards, they can be used without restriction in almost any kind of plant. They can even be provided with spark-enclosed construction for safe operation in hazardous locations.

With batteries exchanged two or three times per 24-hour day, the truck is kept continuously supplied with power. While one battery operates the truck, another is being charged. Except for the few minutes needed to change batteries, the truck need not stop for servicing its power unit. Its electric motor drives have a minimum of wearing parts; are inherently simple and trouble-free. The truck starts instantly; accelerates smoothly; operates quietly; consumes no power during stops. Not only does it make efficient use of power but the current used for battery charging is the lowest-cost power available.

Thus the battery truck is an inherently dependable, safe and economical handling unit, especially when powered by EDISON Nickel-Iron-Alkaline Batteries. With steel cell construction, a solution that is a natural preservative of steel and a fool-proof principle of operation, they are the most durable, longest-lived and most trouble-free of all batteries. *Edison Storage Battery Division of Thomas A. Edison, Inc., West Orange, New Jersey. In Canada: International Equipment Company Limited, Montreal and Toronto.*

EDISON

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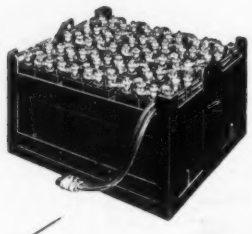
STORAGE BATTERIES



In Industrial Trucks,* EDISON *Nickel-Iron-Alkaline Batteries Give You These Important Advantages

They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.

They can be **charged rapidly;** gassing cannot dislodge the active materials.

They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.

They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents.

They can **stand idle indefinitely** without injury. Merely discharge, shortcircuit, and store in a clean, dry place.

They are **simple and easy to maintain.**

New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 86

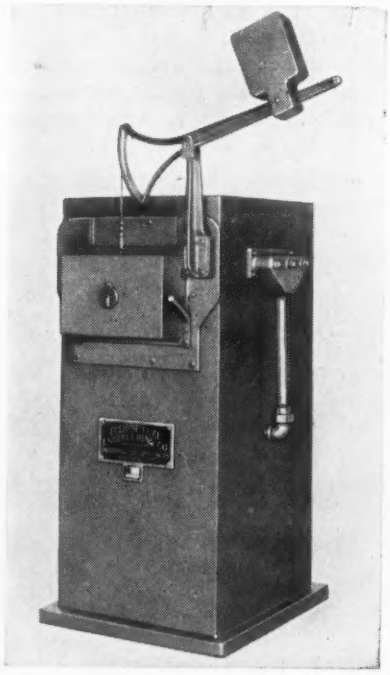
1. Belt Conveyor Table

Island Equipment Corp., 100 Park Ave., New York 17, N. Y., is marketing a light duty belt conveyor table and overhead empty carton conveyor which is made with roller or slide beds. Equipment consists of 3 1/2-inch by 10 gage pressed steel channel frames, supplied in sections. Sections are 10 feet in length and supported either by fixed adjustable floor supports or by ceiling hangers.

Conveyor bed is made up of 1⅜-inch rollers on 8 inch centers or 14 gage steel slide in 12, 18 and 24 inch widths. Its 3-ply cotton belt may be set high, flush or low. Speed may be fixed or variable, adjustment being made by a hand wheel located under the Powerpac driving unit mechanism.

2. Oven Furnace

Designed to fully enclose all working parts, protecting them against dust and damage and workers against contact, the new 814-16 series of heat treating oven furnaces manufactured by Eclipse Fuel Engineering Co., 718 South Main St., Rockford, Ill., has uniform heat distribution, low heat loss and quick



heat-up time. Furnaces are offered in two temperature ranges, 1400 to 1800°F and 2000 to 2500°F, to meet varied demands of heat treating carbon tool steel, alloy steel and high speed steel.

Lining is 4½ inches of insulating refractory brick backed with 2½ inches of insulating brick. Burner tuyeres, flue outlets and pyrometer opening are constructed of firebrick. Hearth may be either silicon carbide or firebrick. Furnace shell is of heavy welded sheet metal.

3. Gas-Air Blowpipe

For use with manufactured or natural gas, propane and compressed air on heating, annealing or soldering operations, the model C-47 gas-air blowpipe, made by Weldit Inc., 990 Oakman Blvd., Detroit 6, Mich., automatically reduces flame to a small pilot light during idle moments. When operator grasps handle to resume work, it relights instantly at the original adjustment.

New model provides a comfortable grip for operator and improved accessibility of valves and seat adjustments. Its longer lever provides for easy flame control, regardless of position in which the blowpipe is held. Control adjustments compensate for fluctuating gas and air flow.

4. Variable Speed Pump

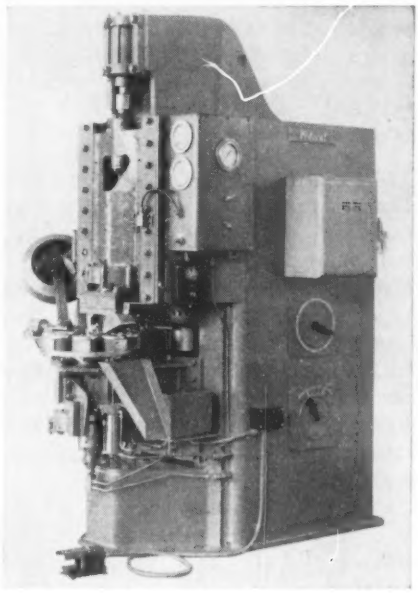
Pumping speeds may be controlled to conform to the correct minimum or maximum required with the Selectaspeed Pumpmaster, made by Waukesha Foundry Co., Waukesha, Wis. Belts are easily changed by removing the back cover of the unit and raising the motor to its highest point by turning the hand wheel that is provided.

Conforming to sanitary standards, the entire unit is enclosed for protection against moisture. It is completely externally sealed. Case is cast aluminum, painted with white enamel.

5. Projection Welder

A hydraulically operated, eight station automatic dial feed table equipped with locking and indexing devices is incorporated in the PH4-12 hydraulic projection welder, developed by Federal Machine & Welder Co., Warren, O., for welding gasoline engine push rod assemblies at the rate of 1200 per hour. Machine has eight welding fixtures consisting of solid copper alloy dies with insulated locators for positioning parts for any one of the various assemblies which the machine is capable of welding.

Welder is equipped with a 400 kilovolt ampere welding transformer,



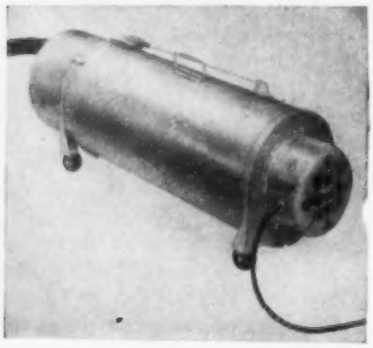
having water-cooled cast copper secondaries wound for 380 volt, 60 cycle alternating current and is provided with 16 point series parallel heat regulation. Machine is equipped with an automatic hopper feed for feeding components of the push rod assemblies.

6. Fume Exhauster

Suited for operation in confined quarters or where the welder must move from place to place in enclosed areas, the portable welding fume exhauster, made by Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa., efficiently removes harmful fumes and provides a clean, safe atmosphere. Unit weighs 25 pounds, is 34 inches long and 10 inches in diameter and is completely self-contained.

In operation, the intake end of the hose is placed approximately 4 inches from the welding arc. Fume-laden air together with slag and sparks is sucked into the unit where it strikes a baffle in the settling

chamber, losing over 20 per cent of its solid impurities in the process. At reduced velocity it passes through a spark arrester screen into the filter



section which may be used without removal of particles (by pulling on a cord) for at least forty 5/32 or twelve ¼-inch rods.

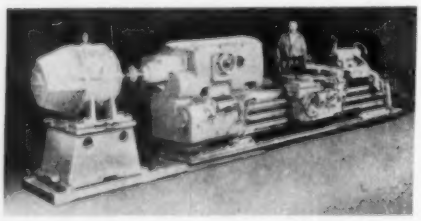
7. Respirator

Protection against poisonous and disease-producing dusts smaller in diameter than 24 millionths of an inch may be obtained from the R-2000 respirator and filter announced by American Optical Co., Southbridge, Mass. It will protect against toxic dusts such as lead, cadmium, arsenic, chromium, etc., pneumosoniosis-producing dusts such as free silica and asbestos and nuisances, as iron ore, coal, aluminum, limestone, etc.

Filter is ⅛-inch thick and slightly over 5 square inches in area. To prolong its life, the respirator is equipped with a gauze prefilter to catch larger particles. Filter is of throw-away type and its container is light in weight.

8. Engine Lathe

Stock may be "hogged" from large diameter work in steel mills, railroad shops and in large shaft manufacturing shops by the 32-inch model 150 engine lathe announced by Monarch Machine Tool Co., Sidney, O. A



separately mounted motor generator set converts alternating current to direct required by the 50 horsepower, 600 to 1200 revolutions per minute motor. Seven speed ranges from 9 to 1200 revolutions per minute are provided, six being through back gearing.

Mounted on front of headstock are a range selector handwheel and a speed control knob. Operator selects speed for a given cut, engages control lever and turns speed control knob until a tachometer registers the desired speed. A hydraulic mechanism changes the gear ratio and starts the spindle. Machine is available from 60 to 276 inches between centers in increments of 24 inches.

9. Fractional HP Motors

Fractional horsepower electric motors built in sizes up to 1/15-horsepower for fan duty applications are designated as type W by their manufacturer, Redmond Co. Inc., Owosso, Mich. Of ventilated 4-pole shaded pole design for alternating current operation, the motors have a large capacity lubrication system circulating oil through porous bronze bearings.

Precision skewed, flush-weld rotor, is microbalanced and has a rust inhibited machined surface. Motors overate at 1500 revolutions per minute on 115 volts, 60 cycles.

10. Pallet Stacker Unit

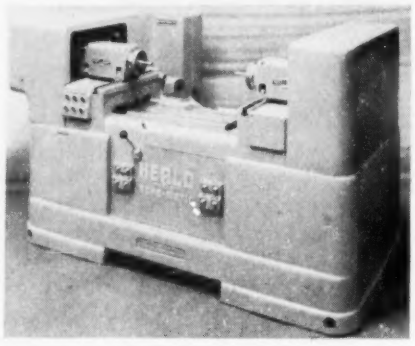
Consisting of an all-steel pallet and a collapsible self-contained attachment for safe, easy stacking of crushable or varying sizes of merchandise, the Multi-Stak pallet stacker unit, made by Elizabeth Iron Works, P. O. Box 360, Elizabeth B, N. J., places no weight on the merchandise itself. When in use, supporting standards lock in an upright position to hold the pallets, placed one above the other, limit being the lift truck height limit or ceiling height.

When not in use, supporting standards fold across the top of the pallet for compact storage in a minimum amount of space.

11. Boring Machines

Exceptionally fast table traverse and reverse dog and positive stop adjusted as one are features of the model 222 and 322 (illustrated) double end Bore-Matic boring machines developed by Heald Machine Co., Worcester 6, Mass. V-belt life has been increased by use of large idlers. Hydraulic systems circulate only the amount of oil needed, keeping it at a low temperature. Oil is not in contact with base, thereby reducing distortion. Machines are equipped for two-way boring with different feeds in both directions.

Both models are similar, except for size. Model 322 is the larger. Six and four-inch wide heads of the 222 and 322 models, respectively, are

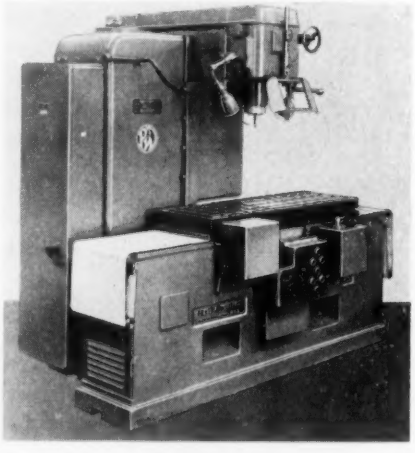


driven by 3 and 5 horsepower motors, two per machine. Maximum revolutions per minute are 4000 and 2500. Table feeds vary with the machine, a fast and slow feed range being provided. A large variety of different cycles may be obtained from the standard units.

12. Die Sinker

Production of original forging and die casting dies, molds and similar work at high levels of accuracy and speed is possible with the No. 4D die sinker, made by Pratt & Whitney Division of Niles-Bement-Pond Co., West Hartford 1, Conn. All machine motions are power operated, with speeds and feeds infinitely variable, but with all motions under pilot hand control.

The three fundamental machine motions necessary for die sinking are provided through a longitudinally



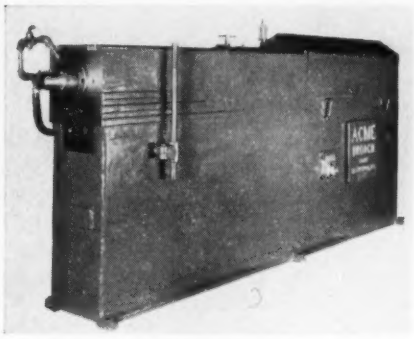
moving horizontal work table of fixed height, and a vertical slide carrying a transverse, or cutter spindle, slide. Movement of these slides is by a Directron control which compounds any two components of travel. Spindle speeds are variable from 35

(For more information, use the card following page 86.)

to 1750 revolutions per minute. Distance from table surface to end of collet may be from 12 to 28 inches. Standard table working surface is 16 x 43 inches, but longer bed and table may be obtained.

13. Horizontal Broach

Made in two models with capacities of 2 and 4 tons and with a 36 inch stroke, the H-4T-36S horizontal broaching machine, built by Acme Broach Corp., East Third St. at Delaware, Lexington 21, Ky., has a puller



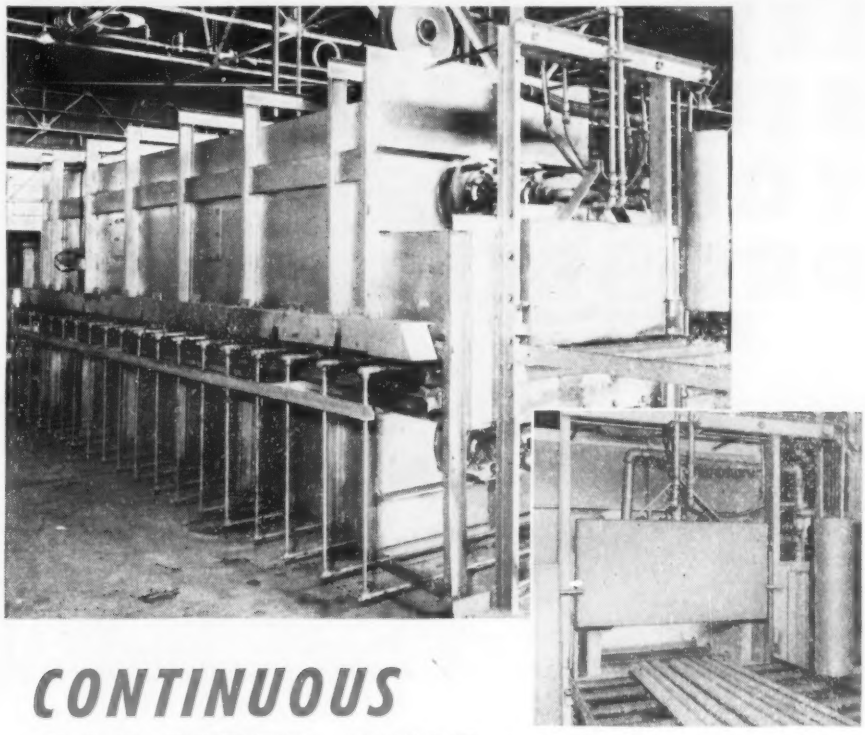
slide fitted with adjustable take-up liners sliding on hardened and ground ways. Machine is totally enclosed. It is equipped with dual cylinders, the main pulling cylinder being directly in line with face plate bore; high speed return cylinder is mounted above it, used for returning pulling slide to starting position.

Maximum overall length of broaching tool is 40 inches. Operation is by a 3 horsepower, 1200 revolutions per minute motor. Motor, hydraulic pump and control valve are mounted on a common base which may be removed for servicing. Pull bolt that receives broach puller is provided with a tightening nut which eliminates lost motion and provides rigid positioning for the puller.

14. Distribution Transformer

Lighter and more compact distribution transformers making use of preferred orientation electrical core steel, are being manufactured by Allis-Chalmers Mfg. Co., Milwaukee, Wis. The new design represents a 17 to 46 per cent saving in weight and a corresponding reduction in size. They are engineered to meet E. E. I.-NEMA joint committee recommendations on standardization of distribution transformers from 1½ to 100 kilovolt-amperes, 2400 through 15,000 volt classes.

Features include Bonderized steel tanks with machine welded seams for leakage protection, high voltage pockets made from a single piece of deep drawing steel welded to the tank wall, recessed tank bottoms for



Continuous annealing of welded stainless steel tubing with gas heat at 2000° F.

CONTINUOUS GAS FIRED TUBE and ROLLER ANNEALING FURNACE

Operates at 2000° Fahrenheit

This continuous, gas fired annealing furnace in a large steel plant in the Great Lakes area, operates at 2000° F. and over—yet production and fuel consumption compare favorably with other types of annealing units, and maintenance costs are substantially less.

These economies have been achieved through the use of "CARBOFRAX"* Refractory Radiant Tubes and Conveyor Rolls—a new and important feature of GASMACO Furnaces into which they are engineered.

"CARBOFRAX"* Refractory Radiant Tubes reduce costly replacement charges inevitable with alloy combustion tubes. They also permit tube firing at temperatures in excess of 2500° F.—substantially higher than the economic limit of alloy tubes. "CARBOFRAX"* Rollers carry heavier hearth loads in the furnace without oscillation and with fewer replacements.

It will pay you to investigate these outstanding features of GASMACO Furnaces on your next heat treating problem. Our engineers are available at any time.

*"CARBOFRAX" is a registered trademark indicating manufacture by the Carborundum Company.

Write for Folder A-100 which shows the complete line and describes various furnace applications.

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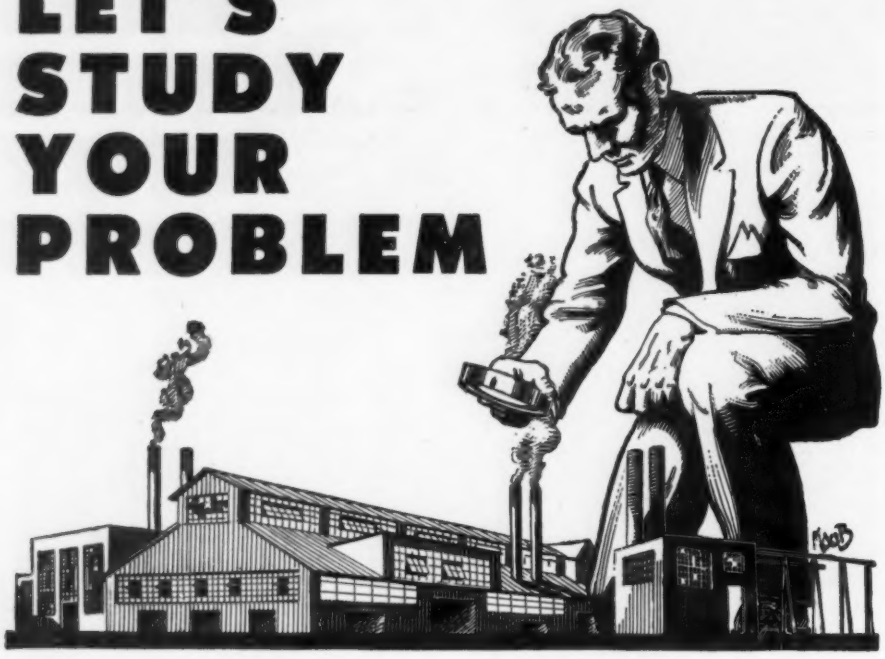

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Is it Materials Handling?

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Is it Power?

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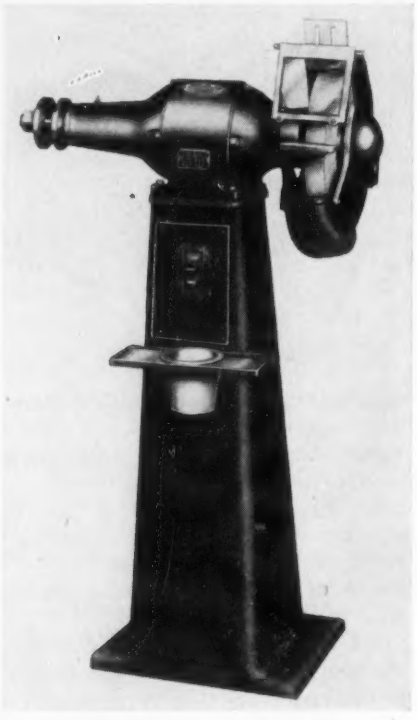
additional protection against rusting and low voltage bushings mounted with a gasketed joint which is held in compression by a pressed gasket ring.

15. Grinders, Buffers

Bench and pedestal type grinders and buffer-polishers equipped with 1 horsepower, 110/220 volt, 50/60 cycle, single phase motors, are announced by Bradford Machine Tool



Co., 657 Evans St., Cincinnati 4, O. Eleven models make up the line, known as 190 series.

Grinders are equipped with safety glass eye shields, spark breakers, tool tray and water pot. Wheel guards are adjustable radially. Seven buffers in the series have varying distances between wheels. Spindles on both buffers and grinders are of chrome nickel steel, mounted on ball bearings. Motors are totally enclosed to NEMA specifications and have pushbutton switches.

16. Warehouse Tractor

For use as a pushing unit and to tow trailer trains, the power Jacktractor, made by Lewis-Shepard Products Inc., 297 Walnut St., Watertown 72, Mass., is powered by the company's 6000-pound capacity power Jacklift drive unit. It has a maximum draw bar pull of 500 pounds. Standard or special towing hitches may be used.

Features include: Vertical handle operation allowing any or all controls to be operated with handle in

any position; an electric brake which applies as soon as handle triggers are released; drive unit may be replaced in 20 minutes, allowing equipment to be kept on the job; use of collector rings and brushes for transmitting power from the main frame to drive unit are eliminated. The unit's storage battery provides a work span of 8 to 10 hours with maximum loads.

17. Thickness Gage

An instrument for measuring corrosion and wall thickness from one side of metallic surface is the Electroflux thickness gage, developed by Scott Electroflux Co., 400 Main St., Waltham 54, Mass. It is designed for nondestructive inspection and testing of metallic containers, vessels and piping while in service. It measures thickness within 3 per cent of actual thickness.

Gage combines a 4-electrode probe, a small 6-volt battery, an electronic voltmeter and power supply for measuring the low voltage output from the probe, and interconnecting cables to permit probe to be moved about at a distance from the metering equipment. Instrument will measure steel thickness from 0.125 to 2.250-inches. It is portable, weighing 55 pounds.

18. Packing Press

Hydraulic cylinder and motor operated pumping unit comprise the packing press developed by Lyon-Raymond Corp., 4100 Madison St., Green, N. Y. It is to be installed on a channel framework. As various products differ in bulk, making it necessary to compress some more than others, the available piston stroke of the press is greater than required for any one operation, but limit stops are provided.

Cylinder is of double acting type, both directions of stroke being power actuated. Pumping unit consists of a ¾-horsepower motor, gear type hydraulic pump, relief valve to prevent overloading, lever controls and a self-contained oil reservoir.

19. Waste Heat Boiler

An exhaust waste heat boiler of new design, developed by Alco Products Division of American Locomotive Co., 30 Church St., New York 8, N. Y., is fully self contained, being enclosed in an insulated steel cabinet measuring 6 feet 6 inches long, 7 feet 6 inches high and 3 feet 2 inches wide. It functions automatically on

New Slant on Plating

A close investigation of your plating operations can show a reduction in finishing cost without jeopardizing the quality of the work. There is that possibility. Here's a thought along that line and an offer.

Udylite, using its modern technical facilities and trained staff, will make this investigation for you at no cost to you and in accordance with a plan that has proved to be very practicable.

First

a preliminary survey of your operations is made by one of Udylite's field engineers.

Then

a complete analysis including laboratory work is conducted by Udylite engineers and electrochemists at headquarters in Detroit.

Finally

a full written report which includes all findings and whatever recommendations may be justified is turned over to you. You may then take whatever action you choose. It does not obligate you.

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exhaust gases from a turbocharged diesel engine or from a household type oil burner.

Boiler will generate 500 pounds of steam per hour on the diesel exhaust and considerably in excess of that on the oil burner. Exhaust gases of 600 to 800° F will operate the unit as long as the engine operates. Upon engine shutdown, the oil burner may be cut in. Boiler may be run dry when no heat is required, acting as an engine muffler.

20. Temperature Recorder

Successfully resisting shock and vibration, a new miniature size temperature recorder, announced by C. J. Tagliabue Mfg. Co., Brooklyn 5, N. Y., may be mounted in trucks, railroad cars and airplanes for checking refrigerating, heating and air conditioning equipment. It is offered in two forms: Single pen recording thermometer for recording temperature only; and two pen temperature and time operation recorder, which charts refrigeration motor running time in addition to recording temperature.

An unbreakable plastic front permits full view of entire chart and pen arm. Chart drive is a 7-day spring-propelled mechanism with charts of 24 or 72-hour duration. "Jiggleproof" pen arm is unaffected by vibration. Overall dimensions of the aluminum cased instrument are 5¾-inches square and 4¼-inches deep.

21. Ventilated Skid Box

For foundry installations where uniform cooling is a requirement, an all-steel ventilated box is announced by Palmer-Shile Co., 16025 Fullerton

Ave., Detroit 27, Mich. It also prevents loss of sand due to dumping as it drains through the side of the box. Other uses are in forging, casting or heat treating departments where there is a need for rapid, uniform cooling of hot metals.

Box is constructed of heavy gage steel mesh on four sides and bottom, with an all welded angle iron framework. It is built with legs for use with fork lift trucks or cranes, but can be supplied with casters, rubber or metal wheels. Corner guides permit stacking. Boxes are built with capacities up to 30 tons.

22. Welding Arc Regulator

An auxiliary unit for use with alternating current welders on inert gas welding with Heliarc torches is produced by Glenn-Roberts Co. 2107 Adams St., Indianapolis 18, Ind. In addition to a high frequency circuit to start and maintain the arc without contacting the work piece with the electrode, the unit, known as the Correct-Arc, has a filter-choke which reduces the rectification effect of the inert gas arc.

Causes of overheating, excessive input, reduced output and low power factor encountered in inert gas arc welding with alternating current

(For more information, use the card following page 86.)

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welders are removed or reduced. Unit provides virtually the same output range at the same input, power factor and heat rise as the welder exhibits on regular metallic arc welding. Two sizes with maximum capacities of 300 and 600 amperes are offered. They may be paralleled for welding at over 600 amperes. Simple connnections permit use with any alternating current welder.

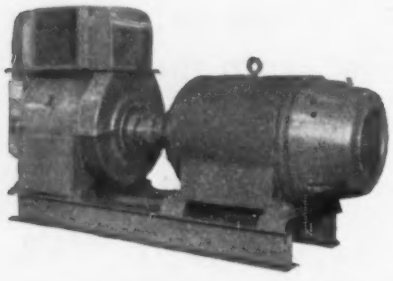
23. Anode Rods

Adjustable anode rods for use in alkaline solutions and also in chromium baths to permit more uniform plating of irregularly shaped parts in still plating tanks are announced by Hanson-Van Winkle-Munning Co., Matawan, N. J. Device consists of brackets welded or bolted to the tank wall to which steel plates or arms, insulated on either side, are pivotally attached. Swivel fittings on outer ends of rods contain insulators which support the anode rod.

Formed in two halves, the insulators are clamped in place around the rods, while the ball anode holders or straight elliptic anodes, as the case may be, are supported by the rod. Electric current is supplied by a flexible cable attached to one end of the rod, while an insulated handle is provided at the other end to permit adjustment as needed.

24. Enclosed Generator

Totally enclosed, unit-cooled generators for use in motor-generator sets or in other generating applications in nonhazardous atmospheres are in production by General Electric Co., Schenectady 5, N. Y. Generators are



available in ratings from 30 to 150 kilowatts and are suitable for use in atmospheres found in steel and cement mills and around large machine tools.

Generator cooling is by an air-to-air surface cooler which maintains safe winding temperatures at all times. When used in a motor-generator set with a totally enclosed unit cooled direct current motor made by GE, the entire unit is assembled at the factory.

25. Oven Heater

Scroll-Aire oven heater, made by Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich., is a direct gas fired heater which mixes the products of combustion directly into the air stream. For paint drying ovens, core and mold ovens, and moisture drying and industrial processing ovens, the heater has enclosed pressure type main and pilot burners using low pressure combustion air.

Its high combustion efficiency is increased by the fan and heater unit which is enclosed in a steel casing with tightly packed insulation. The gas manifold, combustion air manifold, temperature controls and safety controls may be installed by the manufacturer before shipment. Unit is easily adapted to ovens of any design. Four models with varying air and Btu capacities are made.

26. Circuit Breaker

Suited for serving lighting appliance and small motor circuits, a 1 and 2-pole circuit breaker, announced by Square D Co., 6060 Rivard St., Detroit 11, Mich., features a thermal magnetic trip which provides instant tripping on short circuits but which holds on harmless overloads.

Designated as type MO2 Multi-Breaker, its magnetic trip functions in 1/50 to 1/100 of a second, even on minor short circuits. It is combined with a thermal bi-metal which provides the time delayed tripping on moderate overloads. Breakers are furnished in ratings of 15, 20 and 30 amperes, 120/240 volts, alternating current.

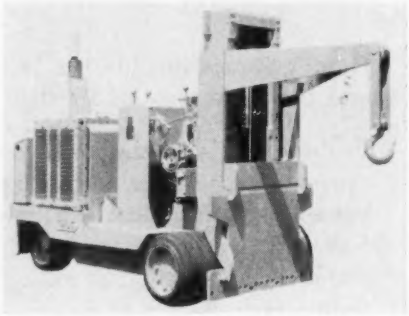
27. Pneumatic Hammer

Line of air-lubricated, air-cooled pneumatic hammers, made by Dow Pneumatic Tool Co., 39 South La-Salle St., Chicago 3, Ill., utilizes a loose fitting piston. It requires a few drops of oil every month or so to prevent possible internal corrosion. Only two parts, either of which can be replaced in 2 minutes, would ever need replacement after extended use.

All of the hammers have a built-in safety tool holder which prevents the tool set from shooting out if the air power is accidentally turned on when the tool is not at work. Tool sets are interchangeable from one type hammer to another. Lightest of two models produced is for riveting, scaling, scraping or cutting, while the heavier model is intended for breaking plaster, chipping, peening and other work.

28. Fork Truck Attachment

An outreach of approximately 4 feet and ability to lift loads up to 18,000 pounds are features of the boom and hook attachment for lift trucks, developed by Yale & Towne



Mfg. Co., Philadelphia, Pa. Truck, with boom attachment removed, can perform work as a normal fork truck.

Attachment permits handling of pieces of equipment which are too bulky to be handled by the usual fork or platform truck. Its use requires a counterweight which is attached to opposite end of truck.

29. Remote Positioning Unit

Basic units which may be combined in a variety of ways to produce systems to meet many industrial remote control needs compose the automatic electronic remote control and positioning unit developed by Askania Regulator Co., 240 East Ontario St., Chicago 11, Ill. The three basic units of the unit, intended for controls of valves, dampers and other mechanisms, are: Transmitter, control amplifier and receiver.

Construction of this servo system is for heavy industry use. Dust proof cases of the three units are built to withstand shocks, vibration and corrosion. Signal lamps and/or audible warning signals are available to indicate position and direction of travel of controlled equipment.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

ALLOCATIONS—Nineteen-forty-seven is ending with a flurry of activity in government circles as plans are laid for setting up a system of voluntary allocation of scarce materials. Iron and steel have been given priority in government planning.

Allocation of steel will likely set the pace for other short-supply materials. Fifteen top-drawer steel industry representatives will meet with Commerce Department officials Jan. 8 to develop a program designed to channel steel to essential uses, prevent leaks to the "gray" market, and increase production.

Steel industry spokesmen indicate willingness to co-operate fully with the government. It is expected a number of steel officials, active in government allocation work during the war, will return to Washington for a time as it is understood the government plans to resurrect some wartime allocation procedures.

OPERATIONS DECLINE—Steel industry activity is retarded by year-end influences but demand continues strong. In general ingot operations last week reflected the loss of Christmas though some mills suspended rolling schedules over the weekend. This week schedules will be drawn to much the same pattern.

Steelmaking operations declined 11½ points last week to 86 per cent of capacity. The seasonal factor had only a negligible effect on blast furnace operations.

Meanwhile, metalworking plants made similar suspensions although fewer metalworking shops will be down on the Friday following New Year's day than on the Friday following Christmas. In general, however, metalworking operations will be somewhat more affected than will those of the steel mills.

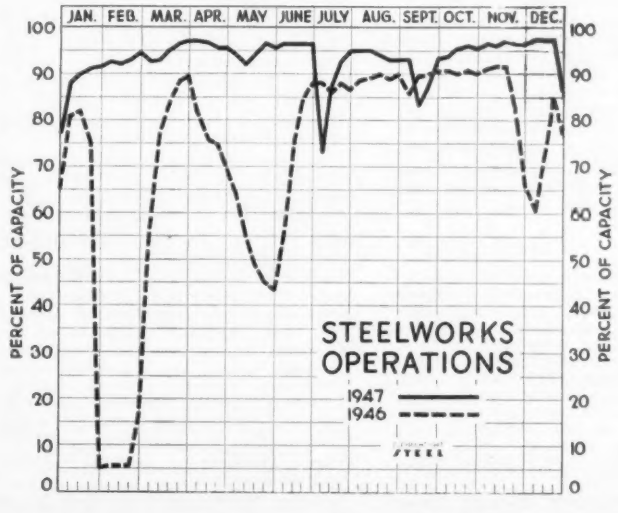
DELIVERIES—Sheet steel deliveries are behind schedule and the outlook for first quarter is for a contraction in new mill bookings. Actual consumer receipts, however, will probably hold up in volume unless weather conditions hamper shipments. Most sellers will require at least a month or more to get caught up on tonnage due for shipment by the end of this year despite the fact production of flat-rolled products in 1947 set a new all-time record at around 18 million tons.

Tight supply in flat-rolled is duplicated in plates, pipe and bars. Continued stringency persists in the face of record peacetime steel production in 1947 of an estimated 84,700,000 tons of ingots, equivalent to around 63 million tons of finished steel.

METALLICS BOTTLENECK—Steel mill and foundry operations are hampered by the shortage of metallics, chiefly pig iron and scrap. The situation is especially acute with respect to scrap. The price stalemate in scrap continues with suppliers marking time pending resumption of large buying by the steel mills. View in the trade is that when the mills do resume active buying they will have to pay higher prices than now are quoted. Meanwhile, prices on foundry grades are soaring.

STEEL PRICES STRONG—No industry-wide upward revision in base prices on steel products is in immediate prospect, but stability indefinitely into the future is jeopardized by continued rise in production costs and threat of another round of wage increases. Recently several isolated advances were effected by individual producers and some upward adjustments in extras have been made. Last week a producer of silvery iron advanced its price $2 per ton.

STEEL's composite price average on finished steel advanced last week to $76.32 from $76.09, reflecting the advance posted by one seller of plates in the East. Other composites held at $57.20 for semifinished steel, $36.31 for steelmaking pig iron, and $39.92 for steelmaking scrap.



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Dec. 27	Change	Same Week 1946	Same Week 1945
Pittsburgh	86	—17	78.5	60
Chicago	79.5	—14.5	70	67.5
Eastern Pa.	85	— 8.5	76	70
Youngstown	71	—20	70	67
Wheeling	93.5	None	77.5	70
Cleveland	81	—10	77.5	67.5
Buffalo	88.5	None	90.5	37
Birmingham	99	— 3	84	85
New England	75	—10	85	80
Cincinnati	78	—11	75	55
St. Louis	89.4	None	68	68
Detroit	92	None	88	62
Estimated national rate	86	—11.5	77	65

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

News Summary—P. 17 *Engineering News—P. 45*

COMPOSITE MARKET AVERAGES

	Dec. 27	Dec. 20	Dec. 13	One Month Ago Nov., 1947	Three Months Ago Sept., 1947	One Year Ago Dec., 1946	Five Years Ago Dec., 1942
Finished Steel	$76.32	$76.09	$76.09	$76.09	$75.41	$64.75	$56.73
Semifinished Steel	57.20	57.20	57.20	57.20	56.80	41.10	36.00
Steelmaking Pig Iron	36.31	36.31	36.31	36.38	36.14	29.10	23.00
Steelmaking Scrap	39.92	39.92	40.25	40.42	37.83	27.69	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, rails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Materials

	Dec. 27, 1947	Nov., 1947	Sept., 1947	Dec., 1946
Steel bars, Pittsburgh	2.90c	2.90c	2.90c	2.55c
Steel bars, del. Philadelphia	3.318	3.318	3.28	2.91
Steel bars, Chicago	2.90	2.90	2.90	2.55
Shapes, Pittsburgh	2.80	2.80	2.80	2.35
Shapes, del. Philadelphia	2.954	2.954	2.94	2.48
Shapes, Chicago	2.80	2.80	2.80	2.35
Plates, Pittsburgh	2.95	2.95	2.95	2.50
Plates, del. Philadelphia	3.17	3.17	3.15	2.558
Plates, Chicago	2.95	2.95	2.95	2.50
Sheets, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.48
Sheets, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.19
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.90	†3.675
Sheets, hot-rolled, Gary	2.80	2.80	2.80	2.481
Sheets, cold-rolled, Gary	3.55	3.55	3.55	3.219
Sheets, No. 10 galv., Gary	3.90	3.90	3.90	†3.675
Strip, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.462
Strip, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.162
Bright basic, bess. wire, Pittsburgh	3.675	3.675	3.675	3.05
Wire nails, Pittsburgh	4.625	4.625	4.25	3.75
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$60.00	$38.00
Slabs, Pittsburgh, Chicago	47.50	47.50	47.50	39.00
Rerolling billets, Pittsburgh	47.50	47.50	47.50	39.00
Wire rod ⅜ to ¼-inch, Pitts.	3.05c	3.05c	2.925c	2.425c

‡ Base, No. 5 to ⅜-in.

Pig Iron

	Dec. 27, 1947	Nov., 1947	Sept., 1947	Dec., 1946
Bessemer, del. Pittsburgh (N.&S. sides)	$37.913	$37.83	$37.83	$31.77
Basic, Valley	36.00	36.00	36.00	29.50
Basic, eastern del. Philadelphia	38.84	38.84	38.72	31.93
No. 2 fdry., del. Pgh. (N.&S. sides)	37.41	37.413	37.33	31.27
No. 2 fdry., del. Philadelphia	39.34	39.34	39.22	32.43
No. 2 foundry, Chicago	36.00	36.00	36.00	30.00
No. 2 foundry, Valley	36.50	36.50	36.50	30.00
Southern No. 2, Birmingham	34.88	34.88	34.51	26.88
Southern, No. 2, del. Cincinnati	38.74	38.544	39.38	30.94
Malleable, Valley	36.50	36.50	36.50	30.00
Malleable, Chicago	36.50	36.50	36.50	30.00
Charcoal, low phos., fob Lyles, Tenn.	50.00	46.40	44.00	37.50
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	140.25	140.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.00	$40.00	$38.00	$28.50
Heavy melt. steel, No. 2, E. Pa.	41.00	42.50	36.75	27.38
Heavy melt. steel, No. 1, Chicago	38.75	38.75	38.75	27.19
Heavy melt. steel, No. 1, Valley	39.75	39.875	39.50	28.75
Heavy melt. steel, No. 1, Cleveland	39.25	39.625	38.25	28.50
Heavy melt. steel, No. 1, Buffalo	42.50	41.81	39.00	26.63
Rails for rerolling, Chicago	60.00	56.25	46.25	31.00
No. 1 cast, Chicago	63.50	49.00	43.50	36.88

Coke

Connellsville, beehive furnace	$12.25	$12.25	$12.00	$8.75
Connellsville, beehive foundry	14.50	14.50	14.50	9.50
Chicago, oven foundry, del.	18.60	18.60	18.50	15.29

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $80-$85. Forging quality $46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $45-$50, sales by smaller interests on negotiated basis at $65 or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $55-$58; Detroit, del., $61; eastern Mich., $62.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66, del. Detroit $69, eastern Mich., $70.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60; sales in open market $66 to $92.

Skelp: Pittsburgh, Youngstown, 2.60c-2.65c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-$70.

Wire Rods: Pittsburgh, Chicago, Birmingham, ⅞ to ¼-in., inclusive, $2.80-3.30 per 100 lb. ⅜ to 11/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.52.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, base, 20 tons one size, 2.90c; Detroit, del., 3.05c; eastern Mich., 3.10c; New York, del., 3.351c; Phila., del., 3.318c; San Francisco (base, del.), 3.63-3.95c; Los Angeles (base, del.), 3.625-3.86c; Seattle, 3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c; Detroit, del., 3.45c; eastern Mich., 3.50c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.70c; Toledo, 3.75c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c; Detroit, del., 4.25c; eastern Mich., 4.30c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.33c; Los Angeles (base, del.), 3.325c; Seattle, 3.88c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

Iron Bars: Single refined, Pittsburgh 7.15c-†7.70c; double refined, 8.00-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

†Hand puddled.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; Philadelphia, del., 3.02c; New York, del., 3.12c; Los Angeles (base, del.), 3.54c; San Francisco, (base, del.), 3.545c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit. Alan Wood Steel Co., Conshohocken, Pa., quotes 3.40c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.70c; eastern Mich., del., 3.75c; New York, del., 4.001c; Philadelphia, del., 3.968c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, 3.85c-3.95c; Youngstown, Sparrows Point, Canton, Middletown, base, 3.95c; Granite City, 4.05c; New York, del., 4.27c; Philadelphia, del., 4.17c; Los Angeles (base, del.), 4.62c; San Francisco (base, del.), 4.625c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 3.95c-4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.45c-4.55c; copper-iron or pure iron, 4.80c-4.90c. Granite City 4.65c and 5.00c, respectively. Los Angeles (base, del.), 5.24c; San Francisco (base, del.), 5.245c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Stainless-Clad 20%: Pittsburgh, Washington, Coatesville, Pa., No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c. Prices include annealing and pickling.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary base, 3.85c-4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 3.90c-3.95c; Granite City, 4.05c; Detroit, del., 4.10c; eastern Mich., 4.15c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c; Granite City, Ill., Kokomo, Ind., 4.90c.

Electrical: Pittsburgh, Chicago, Gary, 5.30c; Granite City, Kokomo, 5.40c.

Motor: Pittsburgh, Chicago, Gary, 6.05c; Granite City, 6.15c.

Dynamo: Pittsburgh, 6.75c; Granite City, 6.85c. Transformer 72, 7.25c; 65, 7.95c; 58, 8.65c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3 60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c; Detroit, del. 3.70c; eastern Mich., 3.75c; Worcester, base, 3.75c-4.10c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c, over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.90c; Granite City, Birmingham, Sparrows Point, 4.00c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point; $5.00.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $14.10.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, Claymont, 3.40c; Geneva, Utah, (base, del.), 3.125c; New York, del. 3.27c; Phila., del., 3.17c; Boston, del., 3.423c; St. Louis, del. 3.269c; San Francisco and Los Angeles, del., 3.67c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 4.45c, basing points.)

Floor Plates: Pittsburgh, Chicago, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.50c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c. Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling: No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.02c; Phila., del., 2.954c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41c-3.47c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.52c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer.....*$3.55-3.80
Spring (except Birmingham)....**$4.25-**4.50

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Nails

Standard and cement-coated .....†$4.25-5.00
Galvanized .....‡$4.00-4.75
Staples, polished and galvanized.....$4.25-5.00

Wire, Merchant Quality

Annealed (6 to 8 base) ..... §$4.20
Galvanized (6 to 8 base) ..... §$4.65
(Fob Pittsburgh, Chicago, Birmingham, per base column)
Woven fence, 15 gage and heavier....††91-101
Barbed wire, 80-rod spool ..... ††101
Barbless wire, twisted 101
Fence Posts (no clamps)..... ††90
Bale ties, single loop ..... ††91

* Worcester, $3.65, Duluth, $3.60, base. San Francisco (base. del.), $4.56. bright basic only.
** Worcester $4.60, Duluth and Trenton, N. J., $4.75. base. San Francisco (base. del.) $5.63 for MB spring wire; $5.28 black premier.
† Worcester $4.55, Cleveland $4.35, base. San Francisco (base. del.) $5.33.
‡ Duluth $4.00, Cleveland $4.10, base. San Francisco (base, del.) $5.08.
§ Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed; $4.65, galvanized. San Francisco (base, del.) $5.21, annealed; $5.66 galvanized.
†† San Francisco (base, del.): Woven fence, 114; barbed wire, 121; bale ties, 115. Duluth (base): Woven fence, 91; barbed wire, 101; fence posts 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse $55-$56 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.05 per 100 lb, fob mill; $3.40 base, Seattle; $3 20, base, Pittsburg, Calif Splice bars, $3.25 per 100 lb, fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.10c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	46	19½	1	56	41½
¼	47	25	1¼	56½	42
⅜	44	22	1½	57	42½
½	50½	34½	2	57½	43
¾	53½	38½	2½ & 3..	58	43½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	49	34	48½	33½	48	33
2½-3.	52	37	51½	36½	51	36
3½-6.	54	39	53½	38½	53	38

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

	Butt Weld		Butt Weld
In.		In.	
⅛	45	1	55
¼	46	1¼	55½
⅜	43	1½	56
½	49½	2	56½
¾	52½	2½ & 3	57

In.	Lap Weld	Elec. Weld	Seamless
2	48	47½	47
2½ & 3	51	50½	50
3½-6	53	52½	52
8	53½	53	52½
10	53	52½	52
12	52	51½	51

Boiler Tubes: Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D.		Hot	Cold	Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled	Drawn
1″	13	....	$11.87	$11.51	$11.51
1¼″	13	....	14.06	11.48	13.64
1½″	13	$13.08	15.69	12.69	15.22
1¾″	13	14.88	17.85	14.43	17.31
2″	13	16.67	19.99	16.17	19.39
2¼″	13	18.58	22.29	18.02	21.62
2¼″	12	20.47	24.54	19.86	23.80
2½″	12	22.42	26.87	21.75	26.06
2¾″	12	23.76	28.48	23.05	27.63
3″	12	24.98	29.90	24.18	29.00
3¼″	11	29.03	34.81	28.16	33.77
3½″	11	31.17	37.39	30.23	36.27
4″	10	38.69	46.38	37.53	44.99
4½″	9	51.28	61.50	....	....
5″	9	59.39	71.18	....	....
6″	7	91.13	109.27	....	....

Pipe, Cast Iron: Class B, 6-in. and over $74.50 per net ton, Birmingham; $79.50, Burlington, N. J.; $86.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ¾ x 6-in. and shorter.....	46 off
¾-in. and larger x 6-in. and shorter...	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter.....	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller.....	46 off	.....
½-in. and smaller.....	.....	44 off
½-in.-1-in.	44 off	.....
⅝-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger.....	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws
(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright).....	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter.....	48 off
¾, ⅞, & 1 x 6 and shorter.....	44 off

Square Head Set Screws

Upset 1-in. and smaller.....	57 off
Headless, ¼-in. and larger.....	40 off
No. 10 and smaller.....	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ½-in. and larger	5.65c
Lebanon, Pa.	5.80c
⅞-in. and under	55 off
Lebanon, Pa. .....55 off plus 15c per cwt.	

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	69.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	38.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50	51.00	40.50	51.00
310....	53.50	56.50	57.50	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403....	23.50	27.00	32.00	23.00	29.50
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.00
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442....	24.50	28.00	35.50	26.00	35.00
443....	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
*501...	9.00	13.00	17.50	13.00	18.50
*502...	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$37.00	$37.50	$38.00	$38.50
Newark, N. J., del.	39.02	39.52	40.02	40.52
Brooklyn, N. Y., del.	....	40.80	44.30	....
Philadelphia, del.	38.84	39.34	39.84	40.34
Birmingham, base	32.88*	33.38*	....	....
Baltimore, del.	....	40.42	....	....
Chicago, del.	....	36.72	....	....
Cincinnati, del.	....	38.74	....	....
Newark, N. J., del.	....	39.14	....	....
Philadelphia, del.	....	38.96	....	....
St. Louis, del.	....	37.77	....	....
Buffalo, base	36.00*	36.00*	36.50*	37.00
Boston, del.	43.128	43.128	46.63	44.13
Rochester, del.	38.02	38.02	38.52	39.02
Syracuse, del.	38.75	38.75	39.25	39.75
Canton, Massillon, O., base	35.50	36.00	36.50	....
Chicago, base	35.50	36.00	36.50	37.00
Milwaukee, del.	36.95	37.45	37.95	38.45
Muskegon, Mich., del.	....	40.21	40.71	....
Cleveland, fob furnace	35.50*	36.00*	36.50*	37.00
Akron, del.	37.34	37.84	38.34	38.84
Duluth, base	36.00	36.50	37.00	37.50
Erie, Pa., base	35.50	36.00	36.50	37.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	36.50	37.00	....	....
St. Louis, del.	37.33	37.83	....	....
†**Neville Island, Pa.,** base	36.00	36.50	36.50	37.00
Pittsburgh, del., N.&S. Sides	36.913	37.413	37.413	37.913
Provo, Utah, base	36.00	36.50	....	....
Seattle, Tacoma, Wash., del.	....	43.03	....	....
Portland, Oreg., del.	....	43.03	....	....
Sharpsville, Pa., base	36.00	36.50	36.50	37.00
Steelton, Pa., base	37.00	37.50	38.00	38.50
Struthers, O., base	36.50	37.00	37.00	37.50
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Troy, N. Y., fob furnace	39.50	....	40.00	....
Toledo, O., base	35.50	36.00	36.50	37.00
Cincinnati, del.	39.35	39.85	....	....
Youngstown, O., base	36.00	36.50	36.50	37.00
Mansfield, O., del.	39.28	39.78	39.78	40.28

† To Neville Island base add: 72.6c for McKees Rocks, Pa., $1.111 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; $1.463 Oakmont, Verona; $1.639 Brackenridge.

*Republic Steel Corp. quotes $3 a ton higher at Birmingham, effective Aug. 13; $4.00 higher for No. 2 foundry and malleable and $3.50 higher for basic at Buffalo, and $3.75 higher at Cleveland, effective on shipments during week ended Dec. 21.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)....$45.50
6.51-7.00..$46.75 9.01- 9.50. 53.00
7.01-7.50.. 48.00 9.51-10.00. 54.25
7.51-8.00.. 49.25 10.01-10.50. 55.50
8.01-8.50.. 50.50 10.51-11.00. 56.75
8.51-9.00.. 51.75 11.01-11.50. 58.00

Fob Jackson, O., per gross ton; Buffalo base $3.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton. **Electric Furnace Silvery Pig Iron:** 8% 14.01-14.50%, $70.75, Jackson, O.; $73.75, Niagara Falls; $73, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn....$50.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $36.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $42.00. Philadelphia, $44.376, delivered. Intermediate phosphorus, Central furnace, Cleveland, $39.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$12.00-$12.50
Connellsville, foundry	14.00- 15.00
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

Oven Foundry Coke

Kearney, N. J., ovens	$17.85
Chicago, outside del.	17.60
Chicago, del.	18.60
Terre Haute, del.	18.15
Milwaukee, ovens	18.25
New England, del.	19.60
Birmingham, del.	15.76
Indianapolis, ovens	17.00
Cincinnati, del.	18.10
Ironton, O., ovens	16.00
Erie, Pa., del.	18.35
Painseville, O., ovens	17.10
Cleveland, del.	18.50
Buffalo, del.	18.75
Detroit, del.	18.25
Philadelphia, ovens	16.90
Swedeland, Pa., ovens	16.90
Portsmouth, O., ovens	16.00
Fairmont, W. Va., ovens	16.25
Pittsburgh, del.	18.21

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	19.00†
Toluol, two degrees	23.00
Industrial xylol	25.00*
Solvent naphtha	25.00*

Per pound fob works

Phenol (car lots, returnable drums)	12.00§
Do., less than carlots	12.75§
Do., tank cars	11.00§

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "household use"	11.00*

Per ton, bulk, fob plants

Sulphate of ammonia	$35.00‡

* Effective Aug. 1. † Freight allowed up to 2 cents. ‡ Effective July 21. § Effective Oct. 1.

Refractories

Per 1000, fob shipping point

Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	75.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low-Heat Duty

Pa., Md., Ohio	56.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago	79.00
Birmingham, Ala.	70.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	24.00
Single bags	28.00

Dolomite

Domestic, dead-burned, bulk, net ton, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.95
Old range nonbessemer	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.55
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.20

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%.	13.50
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 65.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	28.50
50% no ratio	29.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	...	5.30	...	...	...
Galvanized	5.85	...	...	...	...	...	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30*	5.30	5.30	...	...	...	...	...
Shapes, structural	4.30	4.30	...	4.30	...	...	4.30	...	...
Plates	4.55	4.55	4.55	...	4.55	...	...	...	...
Bars, Small Shapes	4.45	4.45	4.45	4.45	...	4.45	...	4.45	4.45

* Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½"& up	H-R Alloy (B4140)	Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city)	4.96	6.03[4]	5.73[4]	6.16[4]	7.41[4]	5.04	6.73	4.95	5.63	7.22	4.82	5.11	6.79
††New York (city)	4.91	6.12	5.82[3]	6.11	7.36	5.03	....	5.02	5.57	7.00[3]	4.75	5.06	6.76
New York (country)	4.76	5.97	5.67[3]	5.96	7.21	4.88	....	4.87	....	....	4.60	4.91	6.61
Philadelphia (city)	4.67	6.28	5.88	5.87	7.12	4.78	5.68	4.83	5.53	7.15[3]	4.55	4.82	6.31
Philadelphia (country)	4.57	6.18	5.78	....	....	4.68	5.58	4.73	....	....	4.45	4.72	6.21
Baltimore (city)	4.31†	5.91	5.61	5.71	6.96	4.76	....	4.81	5.51	....	4.68	4.76	6.26
Baltimore (country)	4.21†	5.81	5.51	5.50	6.75	4.66	....	4.71	....	....	4.58	4.66	6.16
Washington (city)	4.75	....	....	....	....	4.95	....	5.00	5.60[12]	....	4.90	4.95	6.60
Washington (country)	4.65	....	....	....	....	4.85	....	4.90	....	....	4.80	4.85	6.50
Norfolk, Va.	4.80	....	....	....	....	....	....	5.10	5.90	....	5.05	5.05	6.80
Memphis, Tenn. (city)	4.82[20]§§	5.87[20]†	....	6.37	....	5.02[20]	....	4.97[20]	5.87	....	4.97[20]	5.17[20]	6.87[20]
Memphis, Tenn. (country)	4.72[20]§§	5.77[20]†	....	6.27	....	4.92[20]	....	4.87[20]	5.77	....	4.87[20]	5.07[20]	6.77[20]
Buffalo (city)	4.45	....	5.20[3]	6.00	....	4.70	5.65	4.40	5.10	6.65	4.40	4.95	6.20
Buffalo (country)	4.30	....	5.05[3]	5.55	....	4.25	5.50	4.25	4.95	6.65	4.25	4.45	5.75
Pittsburgh (city)	4.25§§	....	5.10[3]†	5.65	6.90	4.35	5.35	4.40	5.10	6.85	4.40	4.60	5.90
Pittsburgh (country)	4.10§§	....	4.95[3]†	5.50	6.75	4.20	5.20	4.25	4.95	6.85	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[3]	5.20[3]	5.78	7.03	4.52	5.35	4.40	5.10	6.85	4.65	4.60	6.15
Cleveland (country)	4.30	5.35[3]	5.05[3]	....	....	....	5.20	4.25	4.95	....	....	4.45	....
Cincinnati	4.671	5.516[3]	....	5.716	6.466	4.694	....	4.703	5.353	....	4.744	4.903	6.244
Detroit	4.55	....	5.30	....	....	4.72	5.63	4.50	5.22	7.10	4.77	4.88	6.28
Indianapolis	4.55	5.32[3]	....	5.87	7.12	4.65	5.90	4.70‡‡	5.40	8.85	4.70	4.90	6.35
Chicago (city)	4.45	5.50[3]	5.20[3]	5.65	6.90	4.35	5.45	4.40	5.10	6.65[9]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[3]	5.05[3]	5.50	6.75	4.20	5.30	4.25	4.95	6.65[9]	4.25	4.45	5.90
Milwaukee	4.629	5.679[3]	5.379[3]	5.829	7.079	4.529	5.629	4.579	5.279	6.979[9]	4.579	4.779	6.229
St. Louis	4.78	5.83[9]	5.53[9]	6.02	7.27	4.68	5.82	4.73	5.47[12]	....	4.73	4.93	6.38
Birmingham (city)	4.45[20]§§	....	....	5.65	....	4.45[20]	....	4.40[20]	5.93[22]	....	4.40	4.65	6.86
Birmingham (country)	4.30[20]§§	....	....	5.50	....	4.30[20]	....	4.25[20]	....	....	4.25	4.50	....
New Orleans	4.98[20]••	....	6.29[18]	....	....	5.18[20]	....	5.13[20]••	6.29[11]	....	5.03[20]••	5.33[20]	7.29[20]
Omaha, Nebr.	5.365	....	....	6.565	7.815	5.265	....	5.315	6.015	....	5.315	5.515	6.965
Houston, Tex.	5.50	....	....	5.50	7.70	5.25	....	5.30	6.80[12]	7.70	5.85	5.35	6.50
Los Angeles (city)	5.75	7.75[3]	7.45[3]	7.40	8.80	6.05	8.70	5.50	7.35[23]	9.35[16]	5.35	5.55	7.65
Los Angeles (country)	5.60	7.60[3]	7.30[3]	7.25	8.65	5.90	8.55	5.35	7.20[1]	9.20[16]	5.20	5.40	7.50
San Francisco	5.20[21]	6.65[3]	....	6.85[3]	7.75[3]	5.75[21]	8.70[16]	5.05[21]	7.00[13]	9.35	5.20[21]	5.30[21]	7.10[21]
Seattle, Tacoma, Wash.	5.30[17]§§	....	7.10[3]‡	6.70	....	5.60[17]	....	5.45[17]	7.45[19]	8.50[13]	5.25[17]	5.45[17]	7.55[17]
Portland, Oreg.	5.30[17]§§	....	7.10[3]‡	6.70	....	5.60[17]	....	5.45[17]	7.45[19]	....	5.25[17]	5.45[17]	7.55[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 1499 lb; [8]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [16]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [23]—500 to 1499 lb.

• Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled; ••add 0.40 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Electro Metallurgical Sales Corp. has revised prices upward on certain products, effective Dec. 6 on spot sales and Jan. 1 on contracts. Following spot prices for calcium, chromium, silicon and briquetted and certain miscellaneous alloys are nominal pending issuance of new price lists by leading sellers.)

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $47, Palmerton, Pa., $51, Pittsburgh. 16% to 19% Mn., $46, Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $153, ton lot $165, less ton $172; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. **West Coast Prices:** Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23c, ton lot 23.6c, less ton 24.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17c, ton lot 17.6c, less ton 18.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.4c per lb of alloy, carload packed, 7.95c, ton lot 8.45c, less ton 8.95c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 17.6c per lb of contained Cr, c.l., packed 18.2c, ton lot 18.8c, less ton 19.5c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 19.1c per lb of contained Cr, c.l., packed 19.7c, ton lot 20.4c, less ton 21.35c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 27c per lb of contained Cr, 0.04% C 26c, 0.05% C 25.5c, 0.06% C 25c, 0.10% C 24.5c, 0.15% C 24.0c, 0.20% C 23.75c, 0.50% C 23.5c, 1% C 23.0c, 2% C 22.5c. Carload packed add 0.8c, ton lot add 1.35c, less ton add 2.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, and C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 23c per lb of contained chromium, carload, packed 23.8c, ton lot 24.35c, less ton 25.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D, bulk, max. 0.50% C grade, 87c per lb of contained chromium, carload packed 88c, ton lot 89.5c, less ton 91.5c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 8.8c per lb of contained Si, carload packed 10c, ton lot 10.65c, less ton 11.3c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.). Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.2c per lb of contained Si, carload packed 12.25c, ton lot 12.85c, less ton 13.45c; Central, add 0.3c for c.l. and 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 12.7c per lb of contained Si, carload packed 13.7c, ton lot 14.25c, less ton 14.8c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 14.35c per lb of contained Si, carload packed 15.35c, ton lot 15.85c, less ton 16.35c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.65c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular, 16.5c per lb of Si, c.l. packed 17.5c, ton lot 18c, less ton 18.5c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade, analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots, 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 11.1c per lb of briquet, carload packed 11.6c, ton lot 12c, less ton 12.4c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8c per lb of briquet, c.l. packed, 8.6c, ton lot 9c, less ton 9.4c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si) Eastern Zone, contract, c.l., bulk 7.65c per lb of briquet, c.l. packed 8.25c, ton lot 8.65c, less ton 9.05c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (**Large size**—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 4.65c per lb of briquet, c.l. packed 5.25c, ton lot 5.65c, less ton 6.05c. (**Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 4.8c, c.l. packed 5.4c, ton lot 5.8c, less ton 6.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 16.75c per lb of alloy, carload packed 17.35c, ton lot 18.85c, less ton 19.85c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 15.5c per lb of alloy, carload packed 16.5c, ton lot 18c, less ton 19c; Central, add 0.5e for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.55c, ton lot 6.9c, less ton 7.25c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.4c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western, add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, ton lots, 1" x D, $1.20 per lb of alloy, freight allowed. Less ton lots $1.30; Central, add 0.75c; Western, add 2.9c, freight allowed. Spot add 5c.

Borosil: (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, bulk 15.75c per lb of material, carload packed 16.5c, ton lot 17.25c, less ton 18c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 37c per lb of alloy, ton lot 39c, less ton 41c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ⅛" x 12 M, 14.3c per lb of alloy, ton lot 15.05c, less ton 15.8c; Central add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: 17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Tin and Bronze Ingot Quotations Advance

14-cent rise in Straits tin is followed by advances in bronze ingot. Demand for metals remains strong

NEW YORK — Tin prices advanced 14 cents a pound, effective Dec. 19, to the basis of 94.00c for Straits. This action was followed by increases of 1/4-cent to 3 cents a pound in bronze ingots. Copper, lead and zinc prices held unchanged in markets featured by sustained strong demand.

TIN — Office of Metals Reserve announced that as of Dec. 19 and until further notice its selling prices per pound for pig tin will be as follows: Grade A, 94.00c; Grade B, 93.85c; Grade C, 93.50c; new grade, 99 to 99.64 per cent, 93.50c for tin content; new grade, 98 to 98.99 per cent, 92.60c for tin content. A summary of maximum prices for tin in recent years shows that in July, 1941, the maximum price of Grade A tin was fixed at 52.00c; on Nov. 12, 1946, the price advanced to 70.00c; on Apr. 2, 1947, to 80.00c.

The Ministry of Supply's new buying price of Malayan tin will be £500 per ton compared with £423, and for Nigerian concentrates, £477 against £405 15s. The selling price of Malayan tin will be £504 per ton against £426 previously. The new price of £504, ex-smelter Singapore and Penang, is equal to 90.73 a pound on the basis of $4.03 for Sterling, bringing the cost of import for a private handler to about 94.00c, cif New York, after inclusion of only very moderate service and commission charges.

Arrival during third quarter of large tonnages of tin resulted in an increase of almost 10,000 tons in United States stocks, the Department of Commerce reported last week. Total imports amounted to almost 26,000 tons. As a result, OMR reserve stocks of tin totaled 16,356 tons at the end of September compared with 10,984 tons at the end of June and 23,214 tons at the end of September, 1946. Consumption of tin in the third quarter was down in all categories, except tin plate, the latter item having increased over 800 tons.

BRONZE INGOTS—Leading makers of brass and bronze ingots advanced prices 1/2-cent to 3 cents a pound in the 88-10-2 group and from 1/4-cent to 1 1/2 cents a pound in the 80-10-10 group. A few items in the other ingot groups were also adjusted upward.

COPPER — Domestic market was in a holiday mood last week, tending to restrict transactions. Volume of business was also restricted by the limited amount of copper being offered for January shipment, both primary producers and smelters being careful not to become oversold.

LEAD — Andrew Fletcher, president, St. Joseph Lead Co., forecast recently an annual domestic consumption for the next few years of about 1 million tons of lead and 1947 consumption in excess of 1.1 million tons. He anticipated that American mines for the next two years would turn out 425,000 tons and that scrap recovery would be 400,000 tons. The remaining 175,000 tons would have to be imported. He said the present price of 15.00c a pound, New York, was not too high when compared with other commodities, but that the future price was anyone's guess.

OMR at the end of November had 4650 tons of lead in its stockpile, unchanged from the October total. However, this agency has released about 3300 tons to consumers for December delivery, so that the stockpile probably will be reduced to only 1300 tons by the yearend.

ZINC — Demand continued fairly active last week with prices unchanged on the basis of 10.50c, East St. Louis, for prime western.

NICKEL—World deliveries of Canadian nickel in 1947 will exceed those of 1946, although well below the wartime peak reached in 1943, according to R. C. Stanley, chairman, International Nickel Co. of Canada Ltd. A reduction of 1.25 cents a pound in the price of nickel in the United States, as previously announced, will become effective Jan. 1, simultaneously with a like reduction in the import duty.

NONFERROUS METAL PRICES

Copper: Electrolytic, carloads 21.50c, delivered Conn.; Lake, 21.62½c del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c 1000-4999 lb; 1½c, 500-999 lb; 2c 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115 19.50-20.00c; 88-10-2 (No. 215) 28.75-29.25c; 80-10-10 (No. 305) 24.50-25.00c; No. 1 yellow (No. 405) 15.50-16.50c; carlot prices, including 25c per 100 lb freight allowance; and ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 15.50-16.00c; No. 12 foundry alloy (No. 2 grade) 15.25-15.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 15.25-16.00c; grade 2 (92-95%) 14.00-15.00c; grade 3 (90-92%) 13.50-14.50c; grade 4 (85-90%) 13.25-14.00c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c, fob Freeport, Tex.; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 to 4000 lb, 35.00-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (including Straits), 94.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 93.85c; Grade C, 99.65-99.79% incl. 93.50c; 99.00-99.64% 93.50c and 98.00-98.99%, 92.60c for tin content.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $79-$81 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg) $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 74.62½c, per ounce.

Platinum: $66-$69 per ounce.

Palladium: $24 per troy ounce.

Iridium: $80-$90 per troy ounce.

Rolled, Drawn, Extruded Products

Copper and brass product prices are fob mill, with freight prepaid on 200 lb or more.

Sheet: Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.46c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

Seamless Tubing: Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

Wire: Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c.

Copper Wire: Bare, soft, fob eastern mills, carlots 26.92c, less carlots 27.42c; weatherproof, fob eastern mills, carlots 27.60c, less carlots 28.10c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 5000 lb, 93.50c; less than 200 lb, 95.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb, 95.75c; less than 200 lb, 97.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., price on application.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.50c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)
Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A, B	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.25, No. 2 copper 17.25, light copper 16.25, composition red brass 14.00, auto radiators 10.75, heavy yellow brass 10.00, brass pipe 11.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.75, No. 2 copper 17.75, light copper, 16.50-16.75, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 15.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.50-17.00, No. 2 15.50-16.00, light copper 14.50, No. 1 composition red brass 12.00-12.50, No. 1 composition turnings 11.50, mixed brass turnings 8.00, new brass clippings nom. 12.00-12.50, No. 1 brass rod turnings 10.00-10.50, light brass 6.00-6.50, heavy yellow brass 8.25-8.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 9.50-9.75, cocks and faucets 9.50-9.75, brass pipe 9.25-9.50.

Lead: Heavy 12.00, battery plates 6.75-7.00, linotype and stereotype 14.00-14.50, electrotype 11.50-12.00, mixed babbitt 10.75-11.00, solder joints 15.50-16.00.

Zinc: Old zinc 5.00-5.25; new die cast scrap 4.50-5.00, old die cast scrap 2.50-3.00.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S 8.50-9.00, old sheets 6.50-7.00, crankcases 6.50-7.00, borings and turnings 2.00-2.50, pistons, free of struts, 5.50-6.00.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. Average	21.50	14.825	10.50	80.00	15.00	33.00	35.00	74.625
Dec. 1-18	21.50	14.80-14.85	10.50	80.00	15.00	33.00	35.00	74.625
Dec. 19-24	21.50	14.80-14.85	10.50	94.00	15.00	33.00	35.00	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00
No. 2 Heavy Melt. Steel	40.00
No. 1 Busheling	40.00
Nos. 1, 2 and 3 Bundles	40.00
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.50-35.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	36.00-36.50
Bar Crops and Plate	45.50-45.00
Low Phos. Steel	44.50-45.00
Heavy Turnings	39.50-40.50

Cast Iron Grades

No. 1 Cupola	52.50-53.50
Charging Box Cast	42.00-42.50
Heavy Breakable Cast.	40.00-41.00
Unstripped Motor Blocks	45.00-46.00
Malleable	59.00-60.00
Brake Shoes	41.00-42.00
Clean Auto Cast	52.50-53.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.00
R.R. Malleable	59.00-60.00
Axles	49.00-50.00
Rails, Rerolling	53.50-54.00
Rails, Random Lengths	50.50-51.00
Rails, 3 ft and under	53.00-54.00
Rails, 18 in. and under	54.00-55.00
Railroad Specialties	51.50-52.50
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-51.00

CLEVELAND

No. 1 Heavy Melt. Steel	$39.00-39.50*
No. 2 Heavy Melt. Steel	39.00-39.50*
No. 1 Busheling	39.00-39.50*
Nos. 1 & 2 Bundles	39.00-39.50*
Machine Shop Turnings	33.00-33.50
Mixed Borings, Turnings	33.00-35.00
Short Shovel Turnings.	35.00-35.50
Cast Iron Borings	35.00-35.50
Bar Crops and Plate	43.00-44.00
Punchings & Plate Scrap	43.00-44.00
Heavy Turnings	39.00-40.00
Alloy Free Turnings	37.00-38.00
Cut Structurals	52.00-54.00

* Plus applicable freight springboard.

Cast Iron Grades

No. 1 Cupola	58.00-62.00
Charging Box Cast	50.00-52.00
Stove Plate	52.00-54.00
Heavy Breakable Cast.	52.00
Unstripped Motor Blocks	50.00-51.00
Malleable	67.00-70.00
Brake Shoes	50.00
Clean Auto Cast	58.00-60.00
No. 1 Wheels	54.00
Burnt Cast	50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-41.00
R.R. Malleable	67.00-70.00
Rails, Rerolling	56.00
Rails, Random Lengths	54.00-55.00
Rails, 3 ft and under	57.00-60.00
Cast Steel	53.00-54.00
Railroad Specialties	53.00-55.00
Uncut Tires	54.00-55.00
Angles, Splice Bars	58.00-59.00

VALLEY

No. 1 Heavy Melt. Steel	39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Bundles	39.50-40.00*
Machine Shop Turnings	34.00-35.00
Short Shovel Turnings.	35.00-35.50
Cast Iron Borings	34.50-35.00
Low Phos.	47.00-48.00

* Plus applicable freight springboard.

Railroad Scrap

No. 1 R.R. Heavy Melt. 40.00-41.00*

*Earmarked for return to steel supplier. Price in open market, 48.00-49.00.

MANSFIELD

Machine Shop Turnings	36.50-37.50
Short Shovel Turnings.	36.50-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
No. 1 Bundles	39.50
No. 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings.	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	52.00
Charging Box Cast	43.00
Heavy Breakable Cast.	44.00
Stove Plate	43.00
Unstripped Motor Blocks	42.00
Brake Shoes	39.00
Clean Auto Cast	50.00
Drop Broken Cast	55.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	42.00
R.R. Malleable	58.00
Rails, Rerolling	50.00
Rails, Random Lengths	47.00
Rails, 18 in. and under	53.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.50-35.00
No. 1 Busheling	34.50-35.00
Nos. 1 & 2 Bundles	34.50-35.00
No. 3 Bundles	34.50-35.00
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	29.50-30.00
Cast Iron Borings	29.50-30.00
Punchings & Plate Scrap	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	52.00-54.00
Heavy Breakable Cast.	45.00-46.00
Clean Auto Cast	52.00-54.00

BUFFALO

No. 1 Heavy Melt. Steel	$41.50-43.50
No. 2 Heavy Melt. Steel	39.25-40.25
No. 1 Busheling	39.25-40.25
No. 1 & 2 Bundles	39.25-40.25
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Cast Iron Borings	34.00-34.50
Short Shovel Turnings.	36.00-36.50
Low Phos.	45.00-47.00
Elec. Furnace Bundles.	44.00-45.00

Cast Iron Grades

No. 1 Cupola	55.00-60.00
Heavy Breakable Cast.	51.00-55.00
Malleable	58.00-63.00
No. 1 Wheels	52.00-57.00
Clean Auto Cast	54.00-58.00

Railroad Scrap

Rails, 3 ft. and under.	50.00-52.00
Railroad Specialties	49.00-51.50

PHILADELPHIA

No. 1 Heavy Melt. Steel	$41.00
No. 2 Heavy Melt. Steel	41.00
No. 1 Busheling	41.00
No. 1, No. 2 Bundles	41.00
No. 3 Bundles	39.00
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Short Shovel Turnings.	35.00-36.00
Bar Crop and Plate	47.50
Punchings & Plate Scrap	47.50
Cut Structurals	47.50
Elec. Furnace Bundles.	44.50-45.50
Heavy Turnings	43.00-44.00
No. 1 Chemical Borings	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	51.00-52.00
No. 1 Machinery Cast.	54.00-56.00
Charging Box Cast	50.00-51.00
Heavy Breakable Cast.	50.00-51.00
Unstripped Motor Blocks	47.50-48.50
Malleable	65.00-66.00
Clean Auto Cast	52.00-54.00
No. 1 Wheels	54.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$33.50-35.00
No. 2 Heavy Melt. Steel	33.50-35.00
No. 1 Busheling	33.50-35.00
Nos. 1 & 2 Bundles	33.50-35.00
No. 3 Bundles	31.50-33.00
Machine Shop Turnings	27.50-28.50
Mixed Borings, Turnings	27.50-28.50
Short Shovel Turnings.	29.00-30.00
Punchings & Plate Scrap	38.00-39.00
Cut Structurals	38.00-39.00
Elec. Furnace Bundles.	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast	46.00-47.00
Charging Box Cast	46.00-47.00
Heavy Breakable	45.00-46.00
Unstripped Motor Blocks	42.50-43.50
Malleable	54.00-55.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.50-32.50
No. 2 Heavy Melt. Steel	31.50-32.50
No. 1 Bundles	31.50-32.50
No. 1 Busheling	31.50-32.50
Machine Shop Turnings	27.00-28.00
Mixed Borings, Turnings	28.00-29.00
Short Shovel Turnings.	28.50-29.50
Bar Crops and Plate	32.50-33.50
Punchings & Plate Scrap	32.50-33.50
Chemical Borings	28.00-29.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-44.00
Charging Box Cast	38.00-39.00
Heavy Breakable Cast.	38.00-39.00
Stove Plate	38.00-39.00
Unstripped Motor Blocks	36.00-37.00
Clean Auto Cast	40.00-42.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.50-39.00
No. 2 Heavy Melt. Steel	38.50-39.00
Nos. 1 & 2 Bundles	38.50-39.00
No. 3 Bundles	36.50-37.00
Machine Shop Turnings	33.50-34.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	34.50-35.00
Bar Crops and Plate	41.00-41.50
Punchings	49.00-50.00
Elec. Furnace Bundles.	39.50-40.00
Heavy Turnings	38.00-38.50
Cut Structurals	43.50-44.00

Cast Iron Grades

No. 1 Cupola Cast	62.00-65.00
Clean Auto Cast	62.00-65.00
No. 1 Wheels	50.00-53.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00-47.00
Malleable	71.00-73.00
Rails, Rerolling	59.00-61.00
Rails, Random Lengths	54.00-55.00
Rails, 3 ft and under	58.00-59.00
Rails, 18 in. and under	62.00-63.00
Railroad Specialties	54.00-55.00
Angles, Splice Bars	57.00-58.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$38.00-39.00
No. 2 Heavy Melt. Steel	37.00-38.00
Machine Shop Turnings	31.00-33.00
Short Shovel Turnings.	33.00-34.00

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	50.00-54.00
Mixed Cast	50.00-51.00
Heavy Breakable Cast.	43.00-45.00
Brake Shoes	46.00-47.00
Clean Auto Cast	55.00-56.00
Burnt Cast	47.00-49.00

Railroad Scrap

R.R. Malleable	60.00-62.00
Rails Rerolling	56.00-59.00
Rails, Random Lengths	50.00-52.00
Rails, 3 ft and under	54.00-55.00
Uncut Tires	46.00-47.00
Angles, Splice Bars	48.00-49.00

BIRMINGHAM

* No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	31.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	51.00
Stove Plate	43.00
No. 1 Wheels	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	45.00
Axles, Steel	39.00
Rails, Rerolling	52.00
Rails, Random Length.	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	20.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

*Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	24.00
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	22.00
Machine Shop Turnings	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	24.50
Cut Structurals	24.50

Cast Iron Grades

No. 1 Cupola Cast	30.00
Charging Box Cast	25.00
Heavy Breakable Cast.	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	39.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast 35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melting	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast 37.50-38.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

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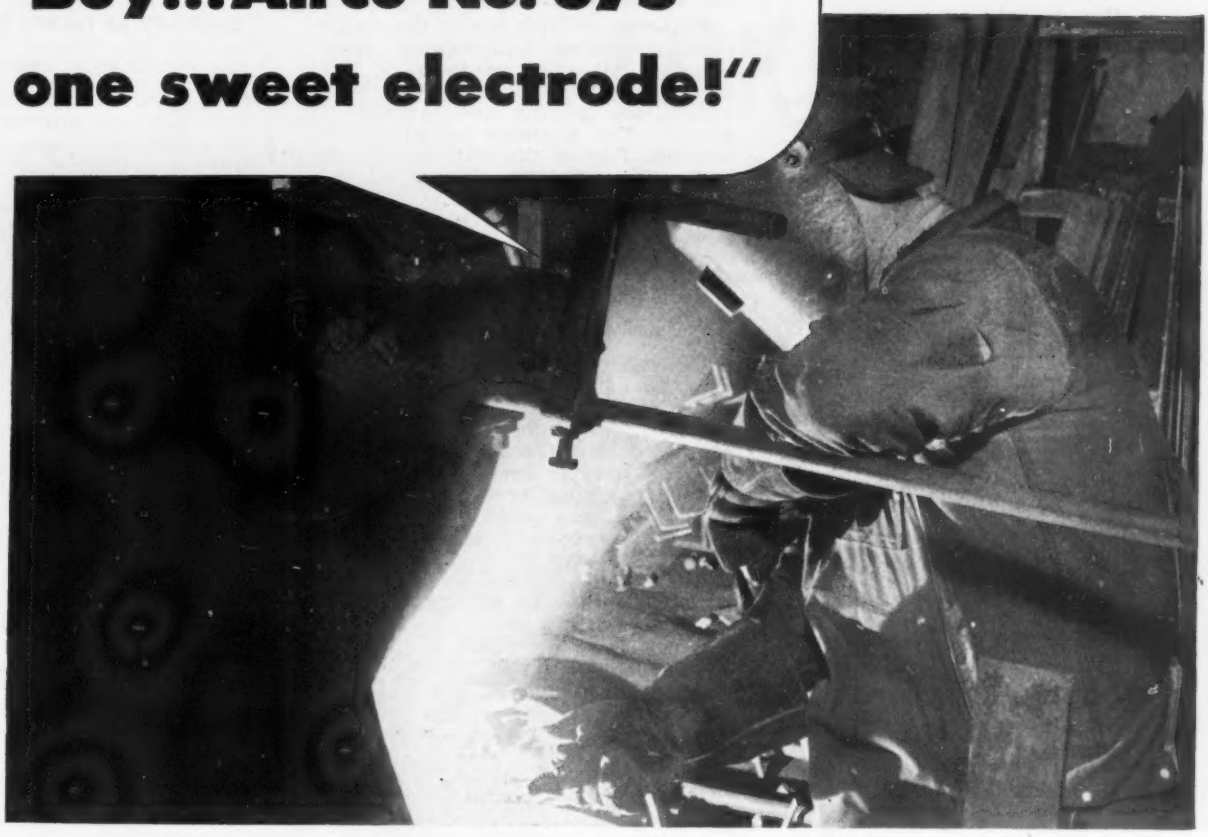

". . . it helped us cut press 'down time' in our plant below two hours"

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He explained: "A cast iron press frame cracked at the base, and was put out of operation. To replace the base meant dismantling the whole machine . . . purchase of a new base . . . and reassembly. But, using Airco No. 375 electrodes, we quickly repaired the cracked base by welding. There was no need to dismantle the press — welding permitted repair with the base in position. The entire repair job was completed within two hours." — High praise for the new Airco No. 375.

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Sheets, Strip . . .

Mill withdrawals, quota cuts and seasonal interruptions spell tightening supply

Sheet Prices, Page 90

Boston — Sales departments have committed their plants for the supply of fabricated steel products far in excess of the ability of the purchasing end to procure steel in the quantity needed in numerous instances. This is especially true as to sheets and strip. No substantial improvement in the supply of flat-rolled is in sight and substitution of other metals, notably aluminum, is on the increase. Users of enamelling sheets, including stove and range builders, are substituting cold-rolled stock in substantial quantities. Hot-rolled carbon sheets, including pickled and oiled, are scarce with no tonnage in sight with some mills while one month or more will be blanked out on cold-rolled in some cases in the first quarter. One supplier, gradually withdrawing from this territory, is reported to have closed the last account this month. This further tightens the enamelling sheet situation. Some second quarter cold-rolled strip volume is being booked, but cold-rolled strip schedules are uncertain and subject to adjustment, depending on hot strip supply; low carbon grades are the tightest.

New York — While undergoing a seasonal lull, demand for sheets continues basically strong. Following the holidays, metalworking shops are expected to get back into operation at the highest rate permissible under present conditions of steel supply. This means, of course, that few, if any, will be able to run at full speed, for stainless and some few specialties are the only sheet supplies that appear to be in fair balance with demand.

Philadelphia—Sheet deliveries are far behind schedule and in general the outlook for the first quarter is for a contraction in the amount of new tonnage allotted. However, actual receipts, including arrearages, probably will hold up in volume unless winter conditions become too severe. Most sellers will require at least a month or more to get caught up on tonnage already due for shipment by the end of this year.

Cleveland — Fuel gas shortages are viewed as the biggest near-term obstacle to meeting insistent demands for flat-rolled products. While mild weather has necessitated no steel production curtailments here thus far this winter, steel producers anticipate that January and February will bring sufficiently cold weather to require temporary curtailment of gas consumption by the mills, thus interrupting steel output.

Chicago — The situation for steel sheets and strip holds unchanged. Demand is tremendous and supply falls considerably short of meeting it. Yearend carryover of unshipped tonnage will be the largest of any steel product. However, through customer quota cuts in fourth and first quarters, mills hope to become current with commitments not later than Apr. 1 and sooner if possible. Consumers who have turned to use of aluminum sheets as a substitute for steel are now concerned about their supply of that commodity in view of the fact that a leading producer temporarily has stopped booking orders for first quarter.

St. Louis — With one of the major steel producers withdrawing from sales of flat-rolled products in this area to avoid freight absorption, consumers are seeking new sources of supply. The producer had given notice last July of this withdrawal, effective when orders already on the books were completed. It is expected the deliveries will be completed in February.

Tubular Goods . . .

Tubular Goods Prices, Page 91

Boston — Utilities are asking for three to four times more pipe above the tonnage bought during the prewar base period on which allocations are based. For the most part, quotas for first quarter are unchanged, although one supplier is five per cent higher. Delivery performance against allocations frequently does not average better than 70 to 75 per cent. Pressure tubing schedules are filled for six months. Of all tubular products, cold-drawn seamless machinical tubing comes closer to being in balance at mill levels. Electric tubing output is hampered by tightness in cold-rolled strip.

Despite the shortages in pipe, some mills have shipped more to this territory than last year; more tonnage than since heavy war-time buying for Quonset Point. Due to extensive blast furnace rehabilitation, one supplier has reduced first quarter allocation 10 per cent.

Water works engineers are anticipating requirements further ahead, placing tentative orders for cast pipe pending town meeting appropriations later. Purchase of close to 15,000 tons of cast pipe in the last two months has included substantial private and utility buying.

Pittsburgh—Pressure for shipments of standard pipe and bulk of oil country goods is not expected to ease for months. Some tightening in delivery schedules also is noted for both stainless and alloy tubing. Output of pipe and tubing this year is estimated at about 6 million tons, a new peacetime record but slightly under the wartime peak established during 1944.

Westinghouse Electric Corp. has been awarded a contract to furnish all electrical equipment for a new crude oil pipeline in which Shell Pipe Line Corp. and the Texas Pipe Line Co. will own interests. The $50 million line will originate at Cushing, Okla., and have terminals at Woodriver and Salem, Ill. It is reported that the 25,000 tons required for this line is being furnished by Youngstown Sheet & Tube Co., Youngstown, O.

Seattle — Seasonal apathy features the cast iron pipe market here. However, the potential demand in this area is heavy and some important jobs are expected to be out early in the new quarter. Competing types of water mains are invading the cast iron field due to the deferred deliveries of the latter. Olympia, Wash., will receive bids Jan. 13 for 20,200 feet, of 4, 8 and 12 inch mains, cast iron and other types included.

Steel Bars . . .

Supply outlook for hot-rolled carbon bars worsens in all sizes contrary to recent trend

Bar Prices, Page 90

New York — Supply of hot-rolled carbon bars is further tightening, with consumers complaining of difficulty in obtaining even the larger sizes, which throughout the greater part of the year had been available without too much shopping around. Those who haven't already received acceptances of specifications for hot carbon bars, regardless of the size or shape of the bars, appear to be in poor position for at least the first three months; and, as the mills are quoting only on a quarterly basis, there is little that buyers can do at present in lining up tonnage for shipment beyond.

Buyers of cold drawn bars are not faced with such a difficulty in placing tonnage for the first quarter, except possibly in some of the very small sizes; and as for alloy bars they can still pick up what they need within five or six weeks.

Boston—End-use to which bars and other steel products are being put is being checked for distribution records, screw machine products and forgings leading in this area. Quality hot-rolled carbon bars are tightening, but merchant quality soft steel stock has eased compared with a few weeks back. Warehouse and consumers are better balanced on this grade. Some producers, late in establishing first quarter allocations, have tonnage to offer for the period. It should be stressed, however, this situation exists only as to merchant grades and not quality grades. To some degree this parallels the development in cold-finished last May. Alloys are also in balance with demand, although buying has improved moderately. Carbon flats are under pressure and some buyers who held back on quality carbon grades until recently are now trying to place tonnage.

Philadelphia — Hot-rolled carbon bars are in tighter supply, with little relief anticipated before the second quarter. Most producers appear fully booked up for the first quarter and are accepting nothing for shipment beyond.

Cold-finished bar supply is relatively tighter than it was, but tonnage can still be had in most sizes for shipment in the first quarter. Meanwhile, the cold drawers are accepting such future business as may be offered, with some having tonnage scheduled for delivery as late as next fall.

Hot and cold-finished alloy bars are available within a month to six weeks.

Tin Plate . . .

Tin Plate Prices, Page 91

Pittsburgh—No new developments have been reported on the Department of Commerce's intention to curtail the use of tin plate for certain general line cans. However, imports of tin increased sharply to 25,937 tons during the third quarter. An important development for tin plate producers is the authorization granted

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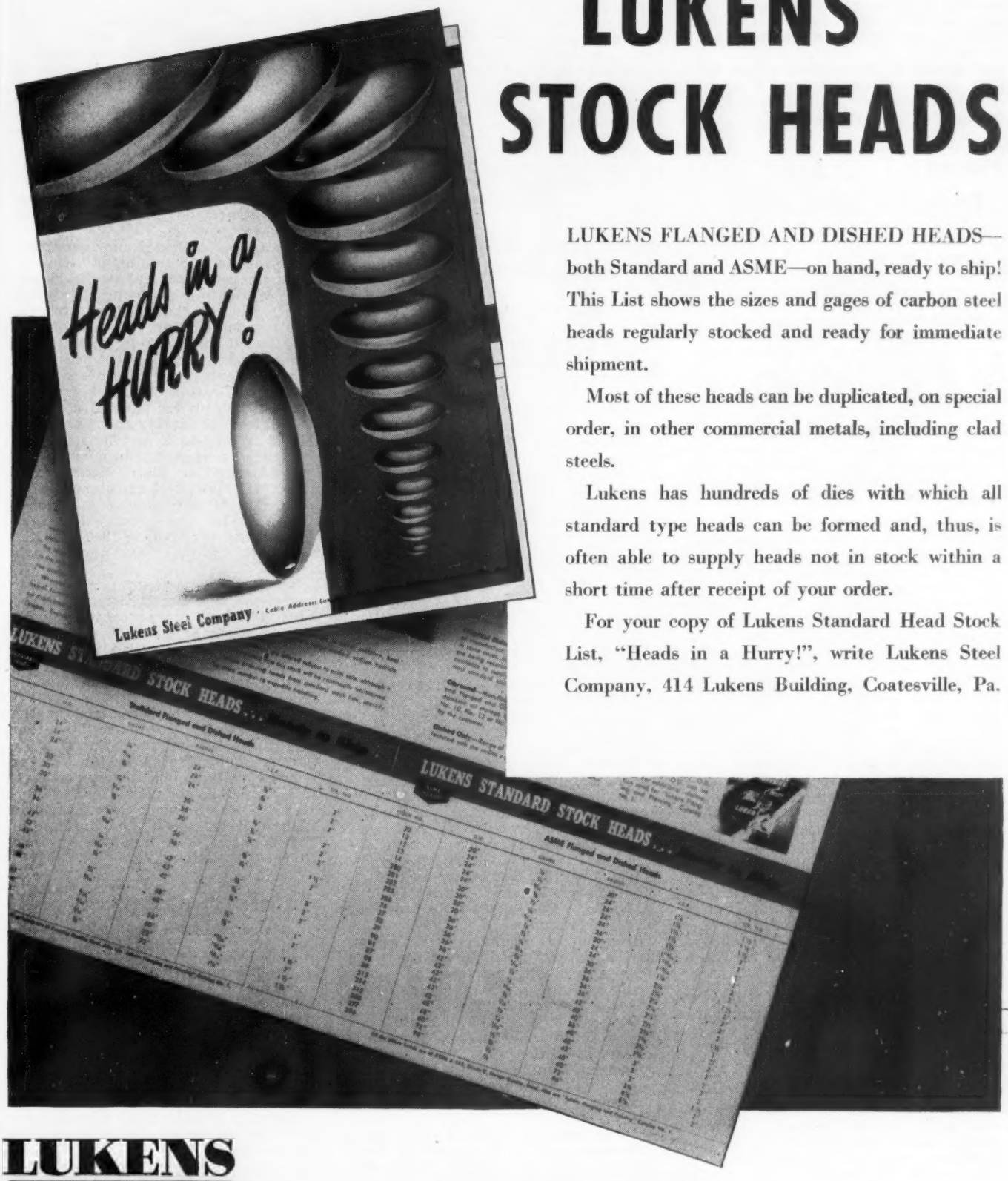

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by RFC's Office of Metals Reserve to the Tin Sales Co. (the government tin selling agency) to increase its prices on Grade A tin 14 cents a pound to 94.00c. The 1948 contract price schedule for tin plate took into consideration such an indicated advance in tin. These new prices are not meeting with any customer resistance, according to sellers. In addition to the 1948 tin plate price revisions reported in the Dec. 15 issue of STEEL, it also should be noted that prices for all ternes, with exception of 8 pound roofing ternes, are subject to change during the coming year.

Plates . . .

Fabricators expect slight improvement in steel supply in near future

Plate Prices, Page 91

Philadelphia—District plate makers are figuring on a little more ship work than heretofore. The New York Shipbuilding Corp., Camden, N. J., has closed on four floats for the Pennsylvania railroad, requiring 3700 tons of plates and shapes, chiefly the former. The Sun Shipbuilding & Dry Dock Co., Chester, Pa., contemplates starting work after the turn of the year on two tankers, requiring 8000 to 10,000 tons of steel, chiefly plates.

Boston—Plate fabricators, short of required tonnage for maintenance of shop schedules, expect slight improvement in the near future. Tank shops are probably the worst off for steel. Allocations for the increased freight car building program will be made on an ingot rather than product basis and distortions in distribution are expected to develop from differences in the price structure. Car shops very likely will avoid paying the higher premiums where possible, concentrating as far as possible on lower cost steel. Pipe line requirements are heavy and, if met in addition to car tonnage, a large slice of plate production will be taken. One domestic pipe line, 30-inch, takes 150,000 tons, 3/8-inch plates. Substantial ratio of pipe needs, although in light gages, must be rolled on wide mills. Structural shops are also short of plates and contractors with jobs taking plates find it practically impossible to place orders for the material; one case in point is the tunnel extension, Boston, for which 500 tons are needed.

New York — Most plate mills are entering the new year with arrearages ranging from three to five weeks production. Some, in fact, have allowed less new tonnage for the general run of their customers for rolling in the first quarter than in the period now closing. Only those engaged in car work appear to have received larger allotments, this being in accordance with the program for stepping up car construction, with an aim to reaching a quota of 15,000 cars a month by the first of July.

Bethlehem Steel Co., Bethlehem, Pa., will build six hopper-type coal barges at its Staten Island yard for M. & J. Tracy Coal Co. These are in addition to four of the same type already under contract for Tracy. Each barge has a capacity of 2500 tons.

Chicago — Demands for steel plates are tremendous, and fabricators of tanks, pressure vessels, pipe lines, and heavy machinery, complain that they are unable to obtain sufficient tonnage to support schedules. Part of the deficiency is attributed to the freight car building program, which under a voluntary allocation schedule has been providing car shops with enough material for the building of 10,000 cars monthly. This program now is being stepped up to permit building of 15,000 cars monthly by mid-1948. Mills have fairly large plate carryovers at yearend and are bending every effort to get current on commitments before end of first quarter.

Structural Shapes . . .

Structural Shape Prices, Page 91

New York — Walsh Contracting Co., 1 East 43rd St., is beginning to place orders for steel for the Clark Hill dam, a War Department project in Georgia. Approximately 2620 tons of structurals are involved, in addition to 3170 tons of reinforcing steel. Structural inquiry in general continues active, with most fabricators confronted with more tonnage than they can figure. As a result, they are selecting only the jobs most attractive to them.

New York—Structural bookings for November amounted to 126,264 tons, bringing the total for the first 11 months up to 1,473,205 tons, against 1,366,183 tons for the same averaged months in the five prewar years, 1936-1940, according to the American Institute of Steel Construction, this city.

Shipments last month amounted to 153,875 tons, bringing the total for the first eleven months up to 1,704,832 tons, an increase of 26.9 per cent over the same months in the five prewar years. Tonnage available for fabrication as of November 30 was 645,440 tons.

Boston — Three fabricators share in contracts for 18 small state bridges, Maine, involving 1053 tons; 390 tons are to be furnished and erected and the balance delivered fob. American Bridge Co., Pittsburgh, will erect 390 tons and supply 162 tons fob. Bethlehem Steel Co., Bethlehem, Pa., takes 393 tons and Bancroft-Martin Rolling Mill Co., Portland, 108 tons. A bridge, Augusta, Me., 2000 tons, will be out for estimates in February, but structural inquiry as the year ends is light with new contracts generally confined to scattered small tonnages. The fabricating industry enters the new year with a backlog of approximately 650,000 tons for fabrication over the next four months. Structural mills have substantial backlogs, but are not clogged with old tonnage to the extent they were a year ago.

Pittsburgh — Scarcity of most structural steel sections, notably wide flange beams, has prevented fabricators from making much headway against their large backlog of unfilled orders. A seasonal decline in volume of new tonnage inquiry is reported by most interests, but present commitments are more than sufficient to sustain operations through the winter months. Structural mills are expected to enter the new year with relatively little carryover tonnage on their books, although the augmented freight car construction program has necessitated in some instances a revision in first allotments to customers.

Considerable steel tonnage is involved in the proposal of Pittsburgh Coke & Foundry Co. to construct a dock, about six miles below the head of the Ohio river. The project also involves two steel sheet pile mooring cells. Some sellers state deliveries of sheet piling are extended at least six months, with supplies tightest of any previous period on record.

Philadelphia — Although fairly substantial tonnage is being figured, structural fabricators report relatively little new work as placed. However, they see a turn for the better in this respect as the new year gets under way.

Chicago — Although new construction projects are coming out slowly, as they have for several weeks, structural fabricators are being extremely selective in the choice of jobs for estimating and bidding. In view of this situation, there is also a growing tendency for large companies preparing to build plants to negotiate contracts for the fabrication of steel before the jobs are put up for general contract bids. Most fabricating shops are committed to mid-1948 and beyond, and schedules are irregular because of delays of receiving plain shapes from mills. Like all steel consumers, they suffered cuts in quotas in last quarter of 1947. The expanded freight car building program in 1948 also has a restrictive effect on next year's quotas.

Seattle — Fabricators report fair operations but production would be much heavier if more steel were available. Shipments from the mills are slow and inadequate. No major projects are up for figures but several are expected early in 1948. Pacific Car & Foundry Co., Seattle, is furnishing more than 100 tons for the Renton, Wash., stadium and other local projects. Bureau of Reclamation Denver has called bids Jan. 22 for general voltage bus structures R 1, 2, 3, Coulee power plant, tonnage unstated. Bids to Bend, Oreg., early in 1948, will include a steel bridge for the Wickiup dam irrigation project on the Deschutes river.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 90

Pittsburgh — A normal seasonal decline in volume of new inquiry is reported by most reinforcing bar sellers. However, fabricating activities continue limited by the inadequate supply of steel which has resulted in badly unbalanced inventories. Restricted supply of reinforcing bars continue to delay completion of many projects and has forced a temporary abandonment of some proposed expansion programs. Output by all producers continues under strict allocation. While monthly production quotas for the first quarter have been reduced slightly in line with more realistic estimates of production, most sellers expect more extensive use of heavy wire mesh in road construction work next spring, due to the critical shortage of reinforcing bars.

Chicago — New reinforcing steel inquiry is coming out in small volume,

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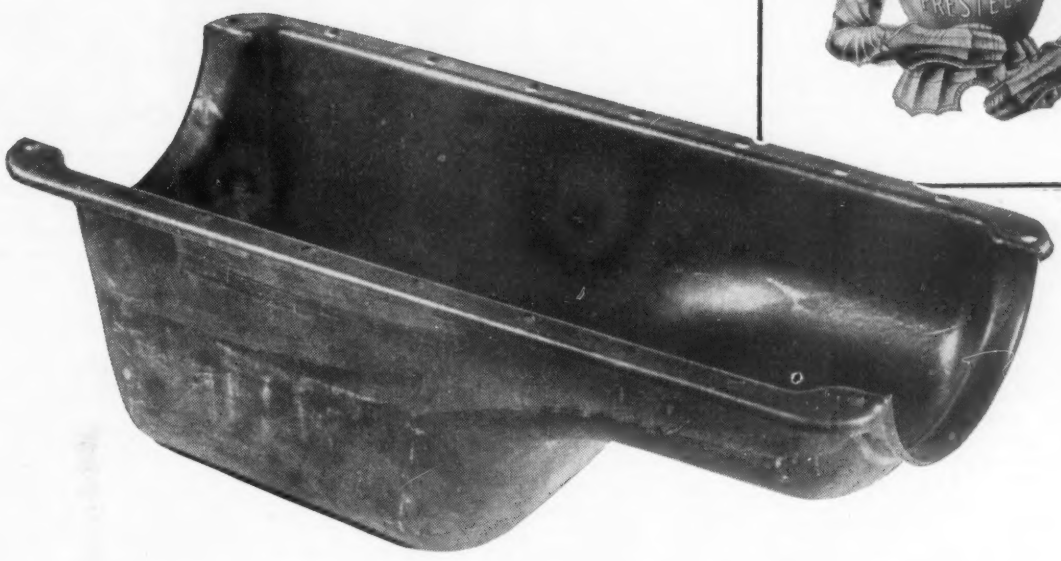

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which is fortunate considering the inadequate supply situation in which all distributors find themselves. Most of them are over-committed and behind in deliveries and dare not add tonnage to their order books until the jobs could be scheduled. The volume of small work, involving only a few tons individually, continues heavy. Contractors who are awarded jobs frequently are obliged to do much shopping around before they succeed in finding a source of reinforcing steel.

Seattle — Small tonnages predominate in buying of reinforcing bars for rolling mills having impressive backlogs of many contracts ranging from 20 to 50 tons each for schools, public works and commercial structures. Immediate concern is to make deliveries as promptly as possible.

Northwest Steel Rolling Mills is closing its rolling plant for two weeks for annual repairs and because of an ingot shortage. The furnace will contnue operations to accumulate mill stock.

Bethlehem Pacific Coast Steel Co. is rolling 110 tons for a stadium at Renton, Wash. Reclamation Bureau will open bids at Boise, Idaho, Jan. 14 for Locket Gulch wasteway, Owyhee project, involving 115 tons reinforcing. Macdonald Building Co., Tacoma, Wash., has a $1,231,000 contract, under revised specifications for building an addition to the Washington state hospital at Steilacoom, tonnage unstated.

Wire . . .

Wire Prices, Page 91

Pittsburgh — Sellers contend there is very little tonnage of nails moving at "black market" prices in spite of the unusual amount of publicity given this matter in recent weeks. Output of nails this year is expected to aggregate about 800,000 tons, while estimated 1948 requirements are placed at 850,000 tons. Sheduled sharp upturn in construction of housing units next year accounts for bulk of the estimated requirements for nails. Some integrated producers expect to install additional nail making machines next year to help meet the increased requirements. Output of nails by nonintegrated producers also could be stepped up if adequate semifinished steel tonnage were made available. However, this prospect is not very promising. At least one producer states production of fencing has declined in recent weeks due to a labor "slowdown." Some producers will enter the new year with substantial carryover tonnage, despite efforts to become current this quarter.

Boston — Spotty improvement in wire rod supply to nonintegrated wire mills is more apparent in high carbon grades than low. Filled for first quarter on numerous products, some mills are setting up April allocations. Tempered stock is included in the extended-delivery category, output being limited by the extent of capacity and equipment in some cases. Cold heading wire inventories are at a critical point with most consumers and screw manufacturers lack inventory balance. Withdrawal of some suppliers from this territory is keenly felt as consumers continue to have difficulty in placing required volume with new sources; some mills formerly doing a substantial volume here have either withdrawn entirely or are selling only specialties. Leading integrated producer some time back revised open hearth schedules by which one unit is down for repairs in rotation.

Pig Iron . . .

Hanna Furnace raises blast furnace silvery pig iron prices $2 per ton

Pig Iron Prices, Page 92

Buffalo — Hanna Furnace Corp. advanced the price of blast furnace silvery pig iron $2 a ton last week, effective as of Dec. 22. The new price of 6.01 to 6.50 per cent silicon iron is $48.75, fob Buffalo furnace. Price differentials for other grades held unchanged.

Pittsburgh — Foundries do not anticipate significant improvement in pig iron supply through the first quarter. Despite the fact that new orders for castings are below the level reported through the first half of this year, most foundries have not been able to make much headway against order backlogs, due to the shortage of iron which restricted output in many instances to a range of 70 to 80 per cent of capacity through the latter months of this year. In an effort to augment depleted inventories some foundries closed down for an extended period over Christmas and intend to close for a like period over New Years. Scarcity of and high prices for scrap have forced some integrated steel producers to increase the proportion of pig iron in open-hearth operations. Output of most blast furnaces continued at a level 10 to 15 per cent below capacity due to poor quality and nonuniform grades of coke.

New York — District pig iron melt will have declined this month, due to lighter shipments of pig iron and to holiday influences. Various foundries were down from the Wednesday preceding Christmas for the entire weekend, and plan to follow up for the same schedule over New Years. In some instances foundries will be down from the Wednesday before Christmas until the Monday following New Years, but these will be exceptional.

Philadelphia — The larger of the two blast furnaces at Swedeland, recently brought in after major repairs, is turning out a little foundry iron, but will soon be on basic, whereupon the smaller furnace will shift from basic to foundry iron and likely will continue on that production for the next several weeks at least. District consumers' melt in the month now closing is off from November, although January melt likely will show a little improvement.

Boston—Withdrawal of a southern producer from this territory following similar action by an integrated Buffalo area furnace narrows the prospective supply of foundry and malleable pig iron to Everett output. Tonnage from other sources is small and confined to basic and special grades, low phos and silvery. While this tonnage withdrawn would normally be considered small, several thousand tons annually by the two producers, the volume is lost for the time being, there being no iron in sight to replace it. Melters of basic will be hard pressed for iron indefinitely, although one producer has a few hundred tons higher quota next quarter. Total 1947 deliveries of iron from outside district furnaces, including malleable and foundry, is less than one third 1943 tonnage and in most cases under 1941. Production at Everett is running about one-third malleable.

Chicago—Prospects for foundries in this area for 1948 are anything but bright. Unable to acquire enough pig iron to satisfy their requirements in the past few months when all of the district's 41 blast furnaces were operating, they will be even shorter now that only 38 stacks are running. In December, three furnaces were blown out for relining and repairs and a fourth is due to be taken off for the same reason on Feb. 15. Steel plants operating blast furnaces are unable to divert iron to foundries to offset the idle stacks because they are using heavy hot metal charges to overcome a scrap shortage to maintain steelmaking at near-capacity. Foundry scrap also is short in view of the fact that pig iron deficiency is offset as far as possible by scrap. Scrap prices have risen rapidly under this demand.

Iron Ore . . .

Iron Ore Prices, Page 92

Cleveland — Consumption of Lake Superior iron held at a high rate in November, although the total was smaller due to the shorter month. Stocks on hand increased 1,369,542 tons during the month over the preceding month and 1,092,299 tons over a year ago.

An outstanding feature of the Lake Superior Iron Ore Association's report was an increase of nine furnaces in blast in this country and 1 in Canada, reducing the number idle to only four. As of Dec. 1, 180 furnaces were in blast in the United States compared with 119 a year ago, while the number idle was 3 compared with 66 a year ago. In Canada, 9 furnaces were in blast on Dec. 1 compared with 8 on Nov. 1 and 7 on Dec. 1, 1946.

Total consumption of Lake Superior iron ore amounted to 7,068,284 tons in November compared with 7,150,860 in October and 6,130,543 in November, 1946. The total for the first 11 months was 73,735,969 tons compared with 56,576,573 tons in the 1946 period. Of last month's total, 6,836,817 tons were consumed by furnaces in the United States against 6,939,280 in October while 231,467 tons were consumed in Canada in November against 211,580 in the previous month.

The amount of Lake Superior iron ore on Lake Erie docks in the United States came to 4,815,635 tons on Dec. 1, against 4,789,345 on Nov. 1 and 4,856,537 tons on Dec. 1, 1946. Stocks at furnaces increased as of Dec. 1 to 38,194,853 tons, including 36,633,266 tons in the United States and 1,561,587 tons in Canada, compared with a total as of Nov. 1 of 36,851,601 tons, including 35,347,883 tons in the United States and 1,503,718 tons in Canada. A year ago, stocks at furnaces came to 37,062,652 tons, of which

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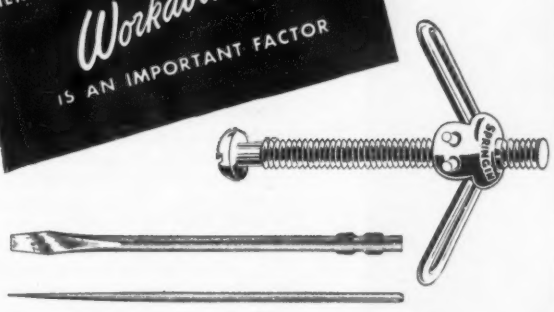

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35,610,830 tons were in the United States and 1,451,822 tons were in Canada. This made total stocks as of Dec. 1, 43,010,488 tons compared with 41,640,946 tons as of Nov. 1, and 41,918,189 tons as of Dec. 1, 1946.

Scrap . . .

Scrap Prices, Page 96

New York — Scrap brokers' buying prices are unchanged at $33.50 to $35 for the principal steelmaking grades. Quotations also are unchanged on turnings, low phos and cast grades. Holiday influences, combined with refusal of dealers to sell steel scrap freely at current levels, have combined to reduce the flow of scrap at this time.

Tonnage moving at the inside price is especially light, which accounts for the current range up to $35, fob shipping point. The undertone in steel scrap is still strong and in cast grades, especially strong.

Typifying the disjointed state of affairs in the scrap metal trade, the report is circulating here of a steel company which decided to discard a lot of old ingot molds and sell them for scrap. They brought $55 a net ton. At almost the same time the company took delivery on an order of new ingot molds, and these were priced at $54 a net ton. Thus, the steel plant could have broken up the new ingot molds and sold them for scrap and still made $1 per ton.

Boston — In the absence of volume buying, there is no substantial test of heavy melting and other steelmaking scrap prices, the former being nominally $31.50 shipping pont. This stalemate is building up yard stocks moderately and more tonnage is in sight from ship-breaking at tidewater points. Yard men, however, claim much of this scrap cost them more than recent prices offered by consumers. In the case of ship scrap, while the quality is eventually good, the cost of taking a ton of scrap from ships is substantially higher than the usual $3.50 charge for preparation. While the ships, mostly smaller warcraft, are being acquired at relatively low cost, the other charges in preparing this scrap are high. Some steel scrap continues to go back to mills direct, but the tonnage is less than it was a few weeks back. The confusion in steel scrap is not so apparent in cast grades; demand is active and prices firm.

Philadelphia — While the principal steelmaking grades of scrap held unchanged last week, cast scrap prices advanced on some grades. No. 1 cupola cast advanced to a range of $51 to $52, delivered, and No. 1 machinery cast to $54 to $56. Malleable was quoted $65 to $66 compared with $65 to $70, as quoted in this publication last week but which actually was too high in view of the fact that the $70 price represented tonnage for shipment into the Cleveland area. Actually the malleable market in the Philadelphia district is as strong as ever, if not a shade stronger, but $66 is the top price here at the moment.

Major open-hearth grades continue at $41. While this level is down from the peak of a few weeks ago, the market is still fundamentally strong. At present, the movement is rather slack due to refusal of yards to commit themselves to much tonnage at present levels and to the general holiday and yearend influences. Collectors and processors of scrap have been favored by particularly good weather in recent weeks. Anything in the way of severe storms probably will impart added strength to the market.

Pittsburgh—With brokers attempting to clear up old orders before the yearend, quoted prices are considered largely nominal with little new buying reported. First real test of industry's efforts to stabilize scrap quotations at levels 100 per cent above OPA peak levels is expected early in January. Some progress has been made in recent weeks to bring prices for low phos grades more in line with the historical relationship with heavy melting steel items. However, as in heavy melting grades, success of this effort is not expected to be subject to significant test until after the first of the year. Reflecting the dearth of transactions in the scrap market recently, scrap inventories at most mills are once more declining. Under such circumstances as record steel output and relatively low volume of incoming shipments, it would appear logical that most mills will have to re-enter the market for substantial scrap tonnages within the next few weeks. No easing in pressure for shipments of cast scrap items is expected for months, reflecting indicated critical shortage in foundry pig iron through

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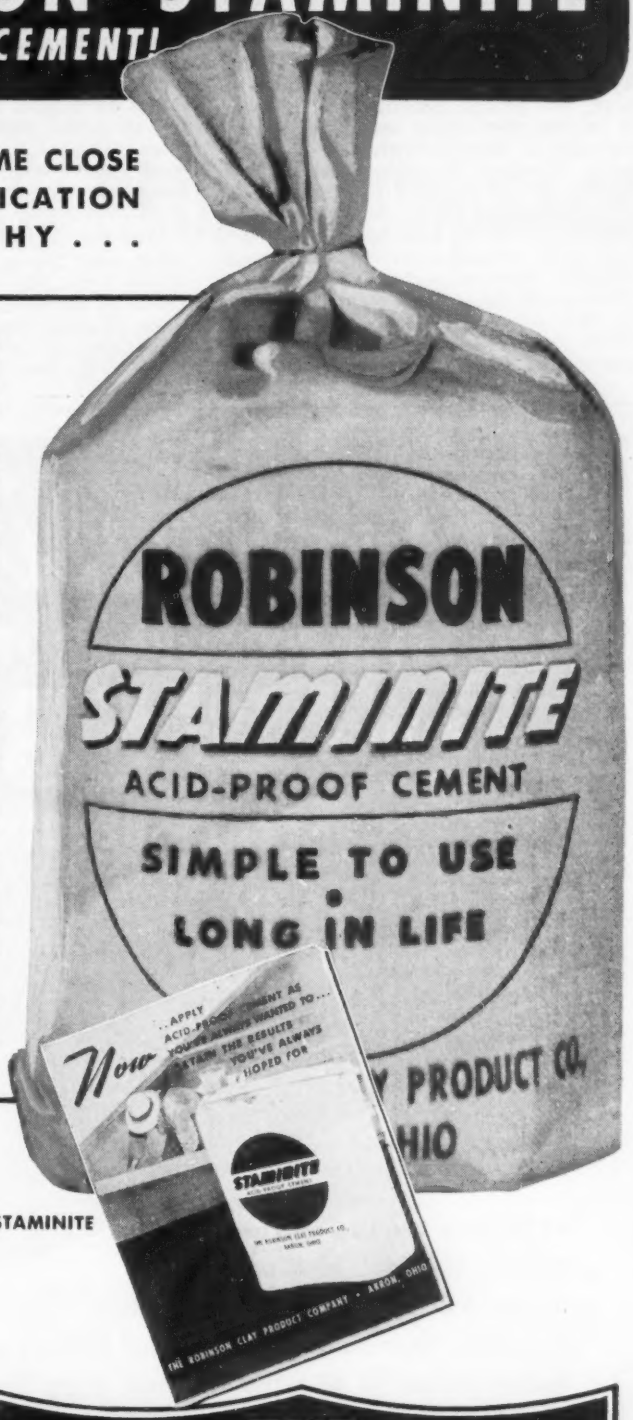

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the first half of next year. There is not much heavy breakable cast available in this area, with what little tonnage moving to consumers said to be unsuitable for breaking into cupola cast.

Cleveland — The Christmas holiday week was quiet in the scrap market here, and prices remained unchanged. It is reported some scrap yards accumulated some inventories of scrap while holding December sales to a minimum for income tax considerations. Factory scrap volume was reported to have declined somewhat, and plant closings for the Christmas holiday were expected to result in further shrinkage of scrap available to the steel mills. Meanwhile, the mills' scrap consumption continued apace. This led to the belief that the mills' scrap inventory position was weakened somewhat, at a time when the approach of severe weather threatens the flow of scrap back to the mills. Consequently, there was speculation as to when and with what price offer the mills would come back actively on the open market for scrap. Mills have been depending increasingly on scrap returned by their steel customers at around $39.50 a ton, a price above which the large mills have been showing resistance for the last two months.

Detroit — Comparative quiet prevails over the scrap market, although good tonnages are moving to local mills at the so-called "formula" price. One broker reports December shipments ahead of November. Thus far, steel mills have been able to hold the price level successfully but the real test will come after the turn of the year. Sentiment in the trade leans to the belief prices will move up at that time. A wild market continues for cast grades, with some foundries willing to pay almost any price for material. Going quotations on No. 1 cupola cast have bee adjusted upward by $7 per ton to $52-54. Melters report increasing difficulty in obtaining pig iron, throwing still more pressure on scrap procurement. More companies with electric furnaces are accepting ingot conversion business which is taking a lot of scrap out of normal channels because of the premium price involved. Even some steel foundries with electric or open hearth furnaces are giving over capacity to produce low-carbon ingots for subsequent processing into sheet and strip.

Chicago — Despite a firm undertone, market for steelmaking scrap held steady last week on the basis of $38.50 to $39 for No. 1 heavy melting. Mills are standing firmly to their offering figure of $39, delivered, for that grade and are maintaining the customary differentials for the other grades. Trading volume is light, leaving the test yet to come when consumers actively seek large tonnages. Railroad grades continued their unparalleled advance due to tremendous demand. Starved for pig iron, foundries are forced to pay fantastic prices for scrap or go without. Railroad malleable has sold for $73 a ton, topping the list.

St. Louis — Prices of cast scrap have surged up again under stimulus of increasing pig iron scarcities. Sales of No. 1 cupola at $54, up $4, are reported as foundries seek to avoid curtailing operations. Steel scrap quotations are largely unchanged, with prospects they will remain so until Jan. 1. Thereafter brokers foresee another, perhaps moderate, rise although mills express determination to hold them at present levels. Scrap shipments continue to ease off as dealers hold back to escape higher taxes. Should prices go up even slightly after the first of the year, that coupled with passing of the tax factor is expected to boost shipments substantially. Mill reserves consequently are dropping steadily and most have less than 30 days' supply. Foundries are on a hand-to-mouth basis. Offerings of railroad scrap have not held up as well in tonnage as expected.

Seattle — Steel scrap supplies are about equal to consumption but the situation leaves mills no great margin of safety. The demand for scrap in this area has practically doubled since 1939 due to larger capacity of old plants and installation of new plants. Scrap dealers report competent labor scarce, which increases their difficulties in processing. Ship breaking plants are improving their facilities and increasing production. While there is a good supply of surplus ships offering, prospective buyers complain of delay in Washington in accepting bids and making awards. Winter weather is retarding country shipments.

At Portland, the WAA has approved a lease to a Kaiser subsidiary company of a portion of the Swan Island shipyard where present shipbreaking operations will expand.

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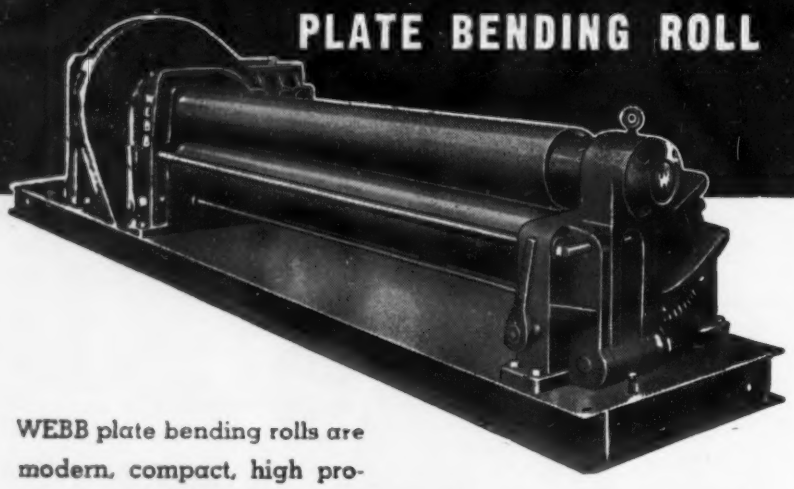

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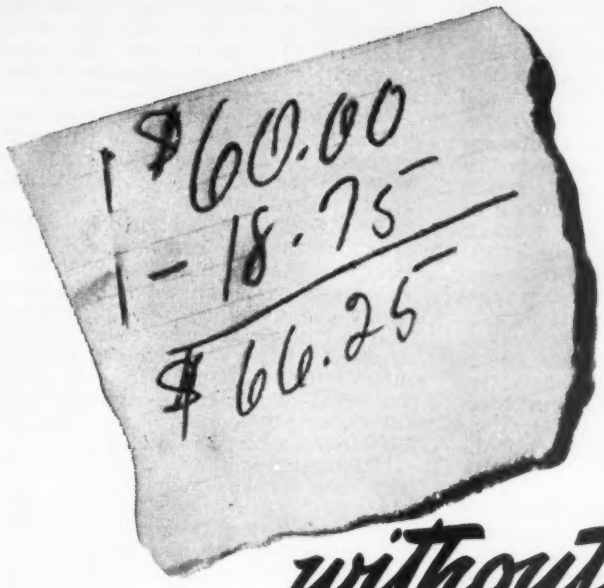

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STEEL

This is an official U.S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council

This firm is reported to have purchased 22 surplus bottoms expected to yield 66,000 tons steel scrap.

Governmental Agencies To Press Drive for Scrap

Washington — President Truman will turn the heat on government agencies soon to dispose of all possible scrap to help the steel industry through the current shortage. The White House is expected to issue a letter outlining the steel industry's current plight and urging all agencies to do their utmost to get scrap moving.

War Assets Administration has been under particular fire by industry spokesmen who claim WAA could generate far more scrap than it has been doing.

W. A. Harriman, secretary of commerce, has sent a letter to scrap dealers asking them to speed the flow of scrap to the mills.

Rails, Cars . . .

Track Material Prices, Page 91

Schenectady—W. R. Herod, president, International General Electric Co. Inc., announced last week that a contract has been signed in Buenos Aires between General Electric S. A., Argentina, and the Argentine State Railways, under which General Electric will supply Argentina with 95 diesel-electric locomoties within the next three years.

Covering 60 single-unit and 35 double-unit engines, plus spares, the contract will approximate $18 million, Mr. Herod said. Deliveries are scheduled to begin early in 1949 and will continue for a 15-month period.

The contract was signed in Buenos Aires following the issuance of a government decree on Aug. 14 which directed the Railway Administration to enter into a contract with General Electric S. A. for the purchase of the locomotives, and directed the Central Bank to make the necessary arrangements for securing the exchange.

"Since the issuance of this decree," Mr. Herod said, "officials and engineers of the Railway Administration and of the International General Electric Co. have carried on negotiations which culminated in the signing of the contract."

The locomotives are of three types, ranging from 70 to 170 tons in size, for services ranging from the "seacoast through the level plains to the mighty Andes," Mr. Herod said. "After intensive study," he added, "the Argentine State Railways Administration, looking toward the utilization of their country's rich natural oil resources, demanded diesel-electric locomotives as the type of motive power representing the most recent development in railroading. General Electric engineers met the requirements of the Administration and the Erie (Pa.) Works of the General Electric Co. is at work on the locomotives."

Specially designed to meet unusual operating conditions found on Argentina's railroads, the locomotives, rated from 800 to 2000 horsepower, will have more horsepower per ton than any meter-gage machines ever designed, Mr. Herod said. This feature will enable the railroads to run heavier trains on faster schedules.

Signing of this contract is an important step in Argentina's five-year program for improving the right-of-way and the rolling stock of all that country's railroads.

New York — Although bids on the outstanding car list, that of the Southern Pacific, involving 9830 miscellaneous cars, are not due in until about the middle of January, there still is enough business either placed or due for early action to bring bookings for this month up to a substantial level. Some trade interests look for December bookings to exceed the 8169 cars awarded in November, in which event bookings from domestic railroads for the year will be substantially in excess of 125,000 cars.

Pointing out that domestic freight car production increased from an average of 2717 cars per month in the first quarter to 8938 in November, S. M. Felton, president, American Railway Car Institute, said that the industry will be producing in the immediate future at the rate of 10,000 cars per month with the goal for the first-half of 1948 calling for a further increase, depending upon the steel supply. Unfilled freight car orders now approximate 125,000 units; passenger car orders, nearly 2400 of which about 1100 are sleepers and 1000 are diners, club, observation and other feature cars. Monthly awards are listed in the following table:

	*1947	*1946	1945	1944
Jan.	9,172	1,481	7,200	1,020
Feb.	13,727	2,328	1,750	13,240
March	12,049	3,512	2,500	6,510
April	9,296	3,564	1,120	4,519
May	7,389	2,900	1,526	1,952
June	12,784	3,335	670	1,150
July	14,840	14,836	3,500	795
Aug.	2,372	9,527	7,240	3,900
Sept.	9,917	11,102	12,840	400
Oct.	17,737	3,407	1,320	2,425
Nov.	8,169	6,690	1,650	1,065
Dec.	.....	3,441	4,116	16,245
Total	.....	66,723	45,432	53,221

* American Railway Car Institute.
† Revised.

Warehouse . . .

Warehouse Prices, Page 93

Chicago — Having suffered cuts in their mill quotas of steel, consumers have virtually stampeded warehouses in an effort to obtain offsetting tonnage. Result is that the latter have lost considerable ground inventory-wise, yet have been unable to satisfy demand. Stocks of flat-rolled products are practically nonexistent. These, like some other products, such as small bars, light structurals and plates, move out almost as fast as they can be unloaded from cars. Alloys are moving faster than they did during the past few months and there is a quickening in cold drawn items.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 92

Philadelphia — Coke production at Swedeland is expected to be sustained at virtual capacity until spring, when the second major phase of the repair program at that point will begin, continuing probably into the fall of next year. However, this further step, once it is taken, likely will not cause the

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hardship for consumers that was experienced early in 1947, when repairs got under way originally. At that time consumer inventories were low; next spring, as now, consumer inventories should be in fairly good shape.

Progress Made by WAA in Real Property Disposals

Inventory recapitulations as of Nov. 30 by the Office of Real Property Disposal, Cleveland Region, War Assets Administration, shows that a total of $212,802,000 (acquisition cost) in real property is now on the way toward WAA classification, negotiation and liquidation.

Brooks Oil Co. Awards Bonus Checks and Gifts

Brooks Oil Co., Cleveland, producer of industrial lubricants, distributed bonus checks and gifts to approximately 75 of its employees of both the United States and Canada at a Christmas party in Cleveland, Dec. 19. The awards were made by A. W. Ward, president, and F. H. McCurdy, vice president.

Canada . . .

Toronto, Ont. — For the nine months ended Sept. 30, Canadian production of primary iron and steel shapes amounted to 2,351,624 net tons while shipments for sale amounted to 1,764,785 tons and deliveries for producers' interchange 587,726 tons, which compares with production of 1,733,141 tons, shipments for sale 1,404,561 tons and producers' interchange 321,368 tons in the corresponding period last year.

For the month of September, production of primary iron and steel shapes in Canada amounted to 256,972 net tons against 234,601 tons in August and 71,341 tons in September, 1946. Output for September included 248,059 tons of carbon steel shapes and 8913 tons of alloy steel shapes.

Primary iron and steel shapes shipped for sale in September amounted to 184,182 net tons including 175,536 tons of carbon shapes and 8646 tons of alloy shapes which compares with shipments in August amounting to 182,324 tons including 172,301 tons of carbon and 10,023 tons of alloy shapes, and with 61,141 tons in September, 1946, which included 57,356 tons of carbon and 3785 tons of alloy steel shapes. The above figures for September which show iron and steel shapes for sale do not include the 63,552 tons which were delivered to producers' own plants or to other plants within the primary industry for further processing.

For September, 1947, shipments of primary iron and steel shapes for sale included 5987 tons of semifinished shapes; 12,571 tons of structurals; 13,522 tons of plates; 22,153 tons of rails; 49,252 tons of hot rolled bars; 10,813 tons of pipes and tubes; 15,889 tons of wire rods; 18,798 tons of black sheets; 7150 tons of galvanized sheets; 512 tons of tool steel; 7985 tons of castings, and 19,550 tons of other shapes.

Of the amount shipped for sale during September, 37,002 tons went direct to railways and railway car shops; 9654 tons to pressing, forming and stamping plants; 21,003 tons to merchant trade products; 20,015 tons to building construction; 11,611 tons to the containers industry; 9423 tons to agricultural equipment, 10,465 tons to the automotive industry; 13,500 tons to machinery plant; 3099 tons to shipbuilding; 7686 tons to mining, lumber, etc., and 2798 tons to miscellaneous industries. Wholesalers and warehousing accounted for 28,181 tons and exports for 9745 tons.

British Steel Billets May Be Raised 5s Early in 1948

London (by cable) — Price of soft steel billets may be increased early in the new year 5s above the present basis of £13 7s 6d a ton, according to report in the trade here. Consultations are proceeding between representatives of industry, the Ministry of Supply, and the Board of Trade. An official of the Iron & Steel Federation states: "For years we managed to cushion to some extent the increases in coal prices by greater efficiency, but the time has come when industry cannot absorb these increases any longer. It takes two tons of coal to make one ton of steel and the increase in price must necessarily be regulated by coal prices."

Seek Gray Market Cure By Co-Operative Means

(*Continued from Page* 19)

one distributor, for example, was cited as selling three carloads of nails at $8.75 a keg. The subcommittee showed the following letter sent out by a Rhode Island chicken hatchery on Nov. 4:

"We are expecting three carloads of nails around the 13th of November and are contacting you first as old customers to give you the first opportunity on them. Sizes will run from 4d to 60d common. While we do not have the exact breakdown on sizes we can guarantee 40% common and not over 5% of slow moving sizes—priced at 14c per lb. net f.o.b. West Warwick, R. I."

Along with this letter the subcommittee showed a receipted bill covering one sale of nails from this shipment—30,000 pounds at $4200.

Premiums Invite Speculation—Not only are the big gray market premiums damaging to the housing program—but the situation is one which invites speculators and encourages pyramiding of the profits sought. The subcommittee reported "phantom" offers of staggering size. A Chicago

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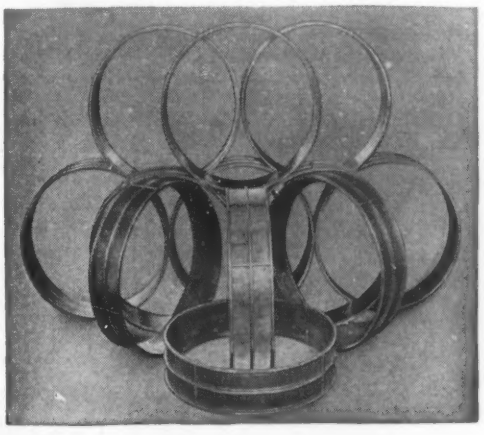

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dealer, for example, was offering 300,000 kegs of nails for direct mill shipment, and a Pennsylvania women's wear firm was offering 300,000 kegs. In both cases, apparently, the offerers had no nails and were simply trying to drum up business in the hope of placing the orders with mills on a split-profit basis.

Some of the mills represented at Senator Flanders' conference admitted that in their desperate efforts to get scrap they had bartered nails for scrap, with indications these nails found their way into the gray market. The mills promised to discontinue this practice.

May Be Recalled—The conference adjourned without provision for any future meeting, but Senator Flanders said that his subcommittee would keep in touch with the industry and that it would be called to Washington again at some future date if that should appear desirable.

Meanwhile the House has authorized its Public Works Committee to make a full-fledged investigation of gray markets to ascertain the extent to which such markets are holding up public works and housing construction. This investigation is expected to cover nails and other materials.

Those present at the conference included: C. F. Hood, American Steel & Wire Co.; F. S. Jones, Colorado Fuel & Iron Corp.; M. C. Schrader, Bethlehem Steel Co.; A. J. Hazlett and J. E. Timberlake, Jones & Laughlin Steel Corp.; Harold J. Ruttenberg, Portsmouth Steel Corp.; N. W. Foy and J. P. Distiler, Republic Steel Corp.; H. F. Lorenz, Angell Nail & Chaplet Co.; N. L. Hite, Continental Steel Corp.; W. K. F. Williams, Atlantic Steel Co.; P. W. Powell, Pittsburgh Steel Corp.; C. Grassell, Wilson Steel & Wire Co., and Ray V. Isham, American Rolling Mill Co.

Components Makers See 1948 as Excellent Year

(*Concluded from Page* 31)

per cent improvement in the coming year as compared with 1947. Order backlogs are still terrific, but the general trend toward leveling off is even discernible here. Bolts, nuts and rivets continue to be difficult to obtain and delivery dates show only the faintest improvement over those reported last summer when 72 per cent of the users of these products had to wait over 60 days for delivery.

Consensus of these manufacturers is that steel supply is a shade better. Here again the larger producers are the most optimistic on this score. Price increases are expected and much concern is expressed over new demands anticipated from labor. This sector of the components industry vividly recalls the prolonged strikes it experienced in 1946.

Expansion projects are planned in several quarters of the fastener field, but production increases are not expected to be great. Activity in regard to research does not appear to be as marked as in other areas of the machine components industry.

Springs and Wire Shapes—Manufacturers of springs and wire forms report that delivery dates are improving. Whereas last summer about 53 per cent of the users of these products could get delivery in under 60 days, the deliveries now are even better than this and the general situation is considered nearing normal. Prospects for 1948 business look to be on a par with last year's. Steel supply is slightly better. From one quarter comes the report of an expected price increase regardless of any rise in labor rates, but for the most part the industry plans to maintain current quotations. Activity in research is great, with the percentage of earnings reported alloted to this aspect of business increasing as much as 25 per cent since 1939.

The Harrington & King PERFORATING Co.

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STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2620 tons, shapes, Clark Hill dam for the War Department, Georgia, orders being placed through Walsh Construction Co., 1 East 43rd St., New York, general contractors; 3170 tons of reinforcing steel also is being placed.

1053 tons, 18 state bridges, Maine; 390 tons, furnishing and erecting to American Bridge Co., Pittsburgh, also 162 tons fob; 393 tons fob to Bethlehem Steel Co., Bethlehem, Pa., and 108 tons to Bancroft-Martin Rolling Mills Co., Portland, Me.

700 tons, 14-inch bearing piles, two piers, Mystic river bridge, Boston, to Bethlehem Steel Co., Bethlehem, Pa.; V. Barletta Co., Boston, general contractor.

200 tons, power plant addition, Narragansett Electric Co., Providence, R. I., to American Bridge Co., Pittsburgh.

100 tons, Renton, Wash., stadium and other local construction, to Pacific Car & Foundry Co., Seattle.

100 tons, switch house, East Braintree Electric Co., Braintree, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

STRUCTURAL STEEL PENDING

3000 tons, sheet piling, breakwater repairs, Buffington plant, Universal Atlas Cement Co., Gary, Ind.

500 tons, refinery addition, Texas Company, Westville, N. J.

450 tons, state bridges, including 10-span, 571-foot viaduct, Waterbury, Conn.; bids Jan. 6, G. Albert Hill, state highway commissioner, Hartford.

100 tons, state bridges, New Hampshire.

100 tons, three 75-foot deck girder spans, Union Village highway, Ompompanoosuc

river, Vt.; bids Jan. 12, U. S. Engineer, Boston.

Unstated, bridge and other structures, Wickiup dam, Deschutes project; bids to Bureau of Reclamation, Bend, Oreg., early 1948.

Unstated, bus structures R 1-2-2 Coulee power plant; bids to Bureau of Reclamation, Denver, Jan. 22.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3170 tons, reinforcing steel, Clark Hill dam for the War Department, Georgia, orders being placed through Walsh Construction Co., 1 East 43rd St., New York, general contractors; 2620 tons of shapes also being placed.

110 tons, stadium at Renton, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Wick & Dahlgren, Seattle, general contract, $298,252.

REINFORCING BARS PENDING

3185 tons, completion Harlan county dam, Harlan county, Nebr.; bids Jan. 29, U. S. Engineer, Kansas City, Mo.

800 tons, Beth Israel hospital, Boston; Volpe Construction Co., Malden, Mass., general contractor.

310 tons, auxiliary outlet sewers, Central South Side system, Princeton Ave., Cont. No. 1-A, Department of Public Works, Chicago; bids Dec. 29.

200 tons, three-span reinforced concrete arch bridge, Old Lyme, Conn.; bids Jan. 6, G. Albert Hill, state highway commissioner, Hartford; other state highway work closing same date takes 250 tons, additional.

115 tons, Lookout Gulch wasteway, Owyhee project; bids to Bureau of Reclamation, Boise, Idaho, Jan. 14.

Unstated, addition to Washington state hospital, Steilacoom; general contract to MacDonald Building Co., Tacoma, $1,231,000 under revised plans.

PIPE . . .

CAST IRON PIPE PENDING

1100 tons, mostly 16-inch, U. S. air base, Limestone, Me.; bids in; Lane Construction Co., general contractor.

750 tons, mostly 20-inch, watermains, Washington, D. C.; bids Jan. 9, district commissioners.

Unstated, 20,200 feet, 12, 8 and 4 inch water mains, or alternates; bids to Olympia, Wash., Jan. 13.

RAILS, CARS . . .

RAILROAD CARS PLACED

Great Northern, 200 fifty-ton gondolas, equipped with 16 drop doors, and 75 covered hopper cars, to American Car & Foundry Co., New York.

New York, Chicago & St. Louis, 400 seventy-ton drop-end gondolas, to the American Car & Foundry Co., New York.

Northern Pacific, 250 seventy-ton ballast cars, to the American Car & Foundry Co., New York.

LOCOMOTIVES PLACED

Argentine State Railways, 95 diesel-electric locomotives, including 60 single-unit and 35 double-unit engines, to General Electric S. A., Argentina. Contract including spares will approximate $18 million; deliveries to begin early in 1949 and to continue for a 15-month period.

Pennsylvania, 125 diesel-electric locomotives; 10, involving four 600-horsepower and six 1000-horsepower units, to American Locomotive Co., New York; 27, involving twelve 600-horsepower and fifteen 1000-horsepower locomotives, to Baldwin Locomotive Works, Eddystone, Pa.; 40, involving eighteen 600-horsepower and twenty-two 1000-horsepower units, to Electro-Motive Division of General Motors Corp., La Grange, Ill.; 23, all 1000-horsepower units, to Fairbanks, Morse & Co., Chicago; 25, all 380-horsepower units, to General Electric Co., Schenectady, N. Y.

CONSTRUCTION AND ENTERPRISE

ALABAMA

GADSDEN, ALA.—War Assets Administration has awarded a $459,000 contract to George McKee Co., Pittsburgh, for overhaul and repair of a government-owned blast furnace here. Furnace has capacity of 15,000 tons per month.

ARKANSAS

LITTLE ROCK, ARK.—Linde Air Products Co., unit of Union Carbide & Carbon Corp., announces that construction will soon start on an oxygen filling and acetylene producing plant here.

CALIFORNIA

CULVER CITY, CALIF.—Lac Chemicals Inc., 8512 Hays St., recently purchased by American-Marietta Co., Chicago, plans a $250,000 development program.

LONG BEACH, CALIF.—Procter & Gamble Mfg. Co., 1601 W. Seventy St., has started a program of equipment replacement and hydrolizer installation.

LOS ANGELES—Russell, Burdsall & Ward Bolt & Nut Co., 4466 Worth St., is erecting a 14,000 sq ft building for storage and pickling.

LOS ANGELES—U. S. Electrical Motors, 200 E. Slauson Ave., has awarded a $58,000 contract to Vinnell Co. Inc., 3025 W. Mission Rd., Alhambra, for a shipping and storage building.

LOS ANGELES—Willys-Overland Motors Inc., 6201 E. Randolph St., plans $1 million investment in equipment for production of cars and trucks.

LOS ANGELES—Republic Supply Co., 1240 Eastland Ave., plans to build a $750,000 warehouse. Architects are Russel and Samaniego, 3275 Wilshire Blvd.

SAN DIEGO, CALIF.—Ryan Aeronautical Co. has received an order from the U. S. Air Force which increases a contract for guided missile weapons by $1,070,000.

SOUTH SAN FRANCISCO, CALIF.—C. C. Goodrich, 1834 McKinnon Ave., San Francisco, has awarded a contract to Ben Blair, 410 Fulton Rd., San Mateo, for a $100,000 plant.

COLORADO

PUEBLO, COLO.—Colorado Fuel & Iron Corp. has awarded a $3 million contract to Morgan Construction Co., 15 Belmont St., Worcester, Mass., for construction of a rod mill at its South Minequa plant.

CONNECTICUT

MILFORD, CONN.—U. S. Electrical Motors Inc., Old Gate Line, will soon let a $500,000 contract for foundation work for a factory. Architect is Leo F. Caproni, 1221 Chapel St., New Haven.

SOUTH WINDSOR, CONN.—Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York, will build a $125,000 chemical plant at Route 5 and Strong Rd.

GEORGIA

ALBANY, GA.—Georgia Power Co., 78 Marietta St. N.W., Atlanta, will build a $100,000 power house for its plant here.

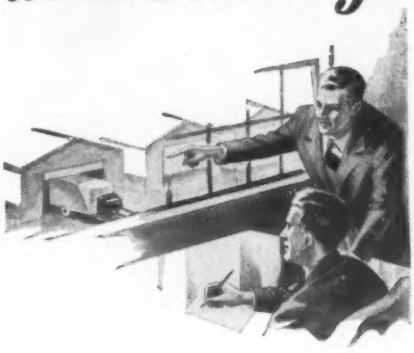
ILLINOIS

CHICAGO—Triangle Package Machinery Co., 960 Spaulding St., will build a 1-story factory. Plans are by Freidman, Alschuler & Sincere, 223 W. Jackson Blvd.

COLLINSVILLE, ILL.—Illinois Farm Supply Co., c/o Illinois Agricultural Association, Donald Kirkpatrick, counsel, 608 S. Dearborn St., Chicago, plans to build a fertilizer plant which with equipment will cost $1,150,000.

EAST ST. LOUIS, ILL.—Aluminum Ore Co.,

STOP Efficiency Loss at Doorways



● Plant efficiency often bogs down at doorways without letting you know it. Costs pile up while vehicles wait for doors to be opened. Time and labor is lost when busy employees open or close doors. Heating and air-conditioning costs soar when doors aren't closed promptly.

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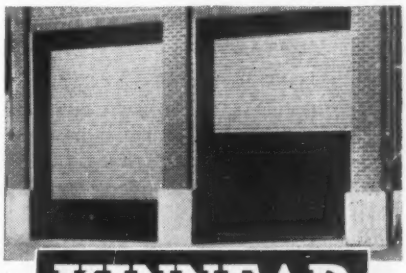

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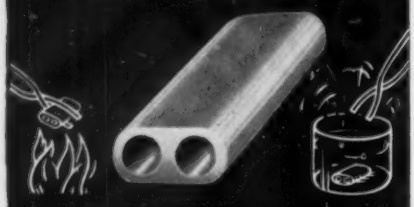

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D. H. Tilson, works manager, will build a $750,000 plant.

EAST ST. LOUIS, ILL.—Monsanto Chemical Co., 1700 S. Second St., St. Louis, will spend $1,500,000 on chemical plant additions here.

INDIANA

FT. WAYNE, IND.—Salisbury Axles Division, Dana Corp., Virgil Stump, manager, 2100 W. State Blvd., has awarded a $150,000 contract to A. C. Wermuth, 1036 St. Marys St., for construction of a factory addition.

KANSAS

WICHITA, KANS.—Forester Mfg. Co., 462 N. Seneca St., will build a $100,000 factory. Plans are by Forsbiom & Park, Beacon Bldg.

KENTUCKY

SOMERSET, KY.—International Minerals & Chemical Corp., 700 Vine St., Louisville, will build a $100,000 fertilizer plant.

LOUISIANA

BATON ROUGE, LA.—Ethyl Corp., c/o Bodman & Murrell, architects, 713 Reymond Bldg., will build a laboratory and pilot plant.

LAFAYETTE, LA.—Evans Electrical Supply Co. Inc., Oscar Evans, president, will erect a $120,000 building on Scott Highway.

MICHIGAN

DETROIT—Arrow Broach Co., 9100 Roselawn Ave., has been formed by William Jewell with a capital of $200,000 to manufacture broaches, tools, gages and fixtures.

DETROIT—H. W. Rickel & Co. has awarded a $209,000 contract to Barton-Marlow Co. to build a manufacturing plant.

DETROIT—Hoffman Motor Development Co., 9664 E. Jefferson, has been formed by R. C. Hoffman with a capital of $75,000 to manufacture engines and gear mechanisms.

DETROIT—Thermocraft Co., 1801 E. McNichols Rd., has been formed by O. R. Monahan with a capital of $100,000 to manufacture heating and cooling systems.

DETROIT — Clercold Inc., 1006 Lafayette Bldg., has been formed by Joseph Stoia with a capital of $100,000 to manufacture compressors and related equipment.

DETROIT—Michigan Coin Recorder Co., 1166 Penobscot Bldg., has been formed by Francis H. Bourke with a capital of $100,000 to manufacture coin operated machines.

GRAND HAVEN, MICH. — Welded Products Co., 335 N. Griffin, has been formed by James B. Scott with a capital of $100,000 to manufacture welded metal products.

GRAND RAPIDS, MICH. — Precision Metal Works Inc., 715 S. Division, has been formed by Herman Anderson with a capital of $100,000 to manufacture precision parts and machinery.

HOLLY, MICH.—Hartz Spring Co. Inc., 209 Elm St., has been formed by Eric A. Hartz with a capital of $200,000 to manufacture steel springs and allied products.

LAKE LINDEN, MICH. — Calumet & Hecla Power Co. will soon start work on a $1 million electric plant to replace its present facilities.

LANSING, MICH.—Lansing Water & Electric Light Commission has awarded a $806,000 contract to Allis-Chalmers Mfg. Co., Milwaukee, for furnishing and installing a turbine generator.

MISSOURI

ST. LOUIS—Monsanto Chemical Co., 1700 S. Second St., has rejected bids for plant additions and alterations. Project is deferred indefinitely.

MONTANA

DILLON, MONT.—Montana Graphite Inc. has been incorporated by Ralph G. Smith and associates with a capital of $250,000.

NEW JERSEY

CAMDEN, N. J.—Louis De Jonge Co., 345 Broadway, New York, plans to build a $800,000 auto factory.

ELIZABETH, N. J.—Interchemical Corp., Empire State Bldg., New York, will build a $2 million plant at Division and York Sts.

NORTH CAROLINA

ASHEBORO, N. C.—National Carbon Co. has awarded a $100,000 contract to S. E. Trogdon for construction of a plant addition.

WHITEVILLE, N. C.—Whiteville Oil Co. Inc., has been incorporated with a capital of $100,000.

OHIO

EUCLID, O. — Fisher Body Co., Coit Rd., Cleveland, will build a $400,000 train shed addition to its plant at 20001 Euclid Ave.

TOLEDO, O.—Toledo Smelting & Refining Co., Elbon St., which was recently sold to Harry A. McDonough and associates of Cleveland, is reportedly making plans to double the size of its present plant and to provide foundries for smelting of aluminum.

WILLARD, O.—Baltimore & Ohio Railroad is spending about $2,500,000 to improve its local yard. Program calls for enlarging diesel shops, building a coal dock and other items.

PENNSYLVANIA

ALIQUIPPA, PA. — Jones & Laughlin Steel Corp., Third and Ross Sts., Pittsburgh, will build additional byproduct and benzol recovery facilities costing $3,461,000.

SUNBURY, PA.—Pennsylvania Power & Light Co., Allentown, plans to build a steam electric generating plant costing $20 million. Engineer is Ebasco Services Inc., 2 Rector St., New York.

TEXAS

AMELIA, TEX.—Sun Oil Co. plans a $300,000 laboratory, shop and office building on Route 90.

BEAUMONT, TEX.—Gulf States Utilities Co., 362 Liberty Ave., plans a $50 million construction program to meet expanded needs.

BIG LAKE, TEX.—Witco Hydrocarbon Corp., c/o contractor, has awarded a $3,800,000 contract to Fish Engineering Corp., M & M Bldg., Houston, for construction of a natural gasoline and carbon black plant in Barnhart Field.

CARTHAGE, TEX.—Glassell & Glassell, Commercial National Bank Bldg., Shreveport, La., will build a $1,250,000 gasoline plant near here.

DALLAS, TEX.—Fred W. Glitsoh & Sons, Caroline St., are constructing a $300,000 fabricating plant on Singleton Blvd.

WEST VIRGINIA

FAIRMONT. W. VA.—Monongahela Power Co., plans construction of new plant and line facilities at a cost of $40 million.

GLENDALE, W. VA.—Triangle Conduit Co., Jersey Ave., New Brunswick, N. J., has awarded a $250,000 contract to Wigton Abbott Corp., 1225 South Ave., Plainfield, N. J., for construction of a plant.

IDAMAY, W. VA.—Industrial Collieries Corp., Bethlehem, Pa., has awarded a $60,000 contract to Mountaineer Engineering Co., 507 Blvd. of Allies, Pittsburgh, for construction of a mine building and several shops.

WISCONSIN

MILWAUKEE—Heil Co. has abandoned plans to construct a $1 million plant at Sheboygan. Plans now are to locate the facility in the Milwaukee area.

MILWAUKEE—Koehring Co., 3026 W. Concordia Ave., has awarded a $65,000 contract to Lupinski Inc. for construction of a foundry addition.

MILWAUKEE—Western Machine Co., 121 N. Broadway, plans to build a $200,000 factory and office addition.

WAUSAU, WIS. — American Foundry & Machine Co. will build a 1-story shop addition. Plans are by Oppenhamer & Obel.

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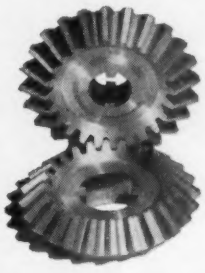

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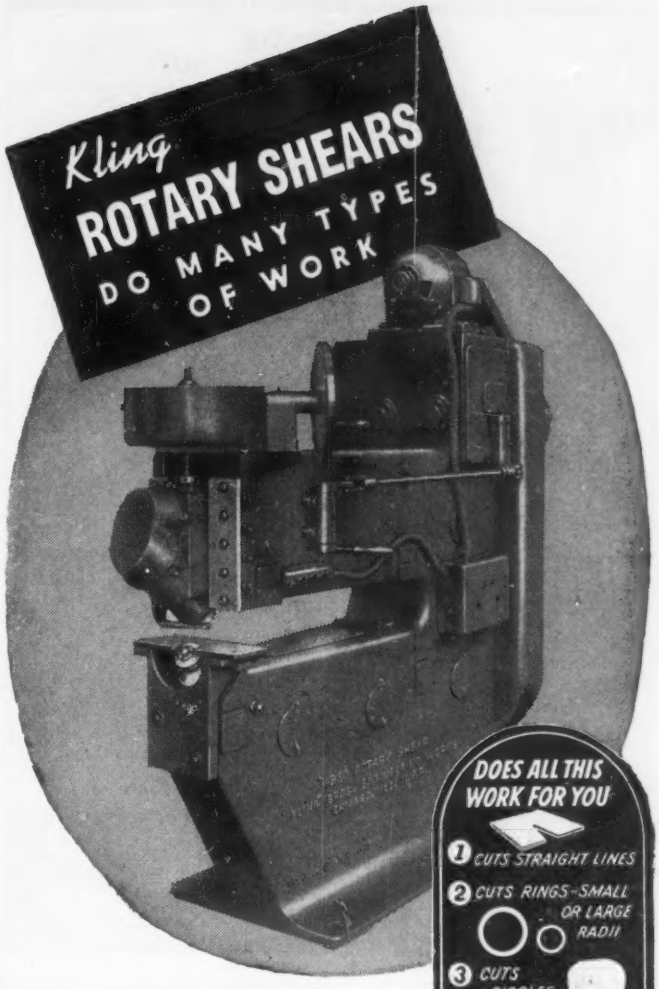

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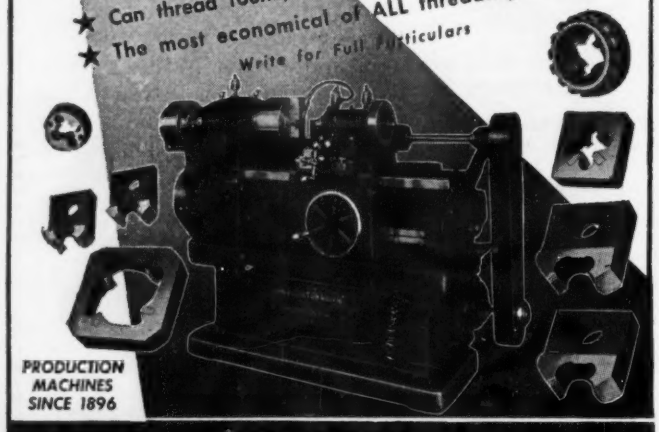

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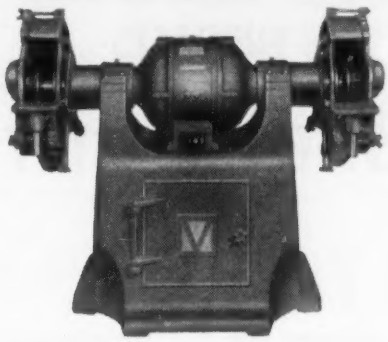

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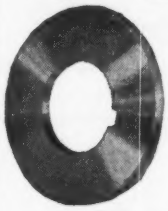

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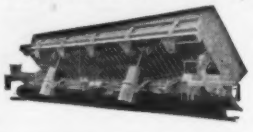

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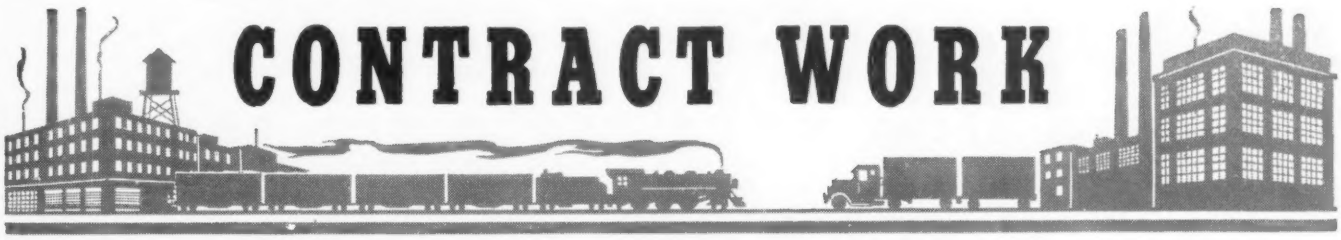

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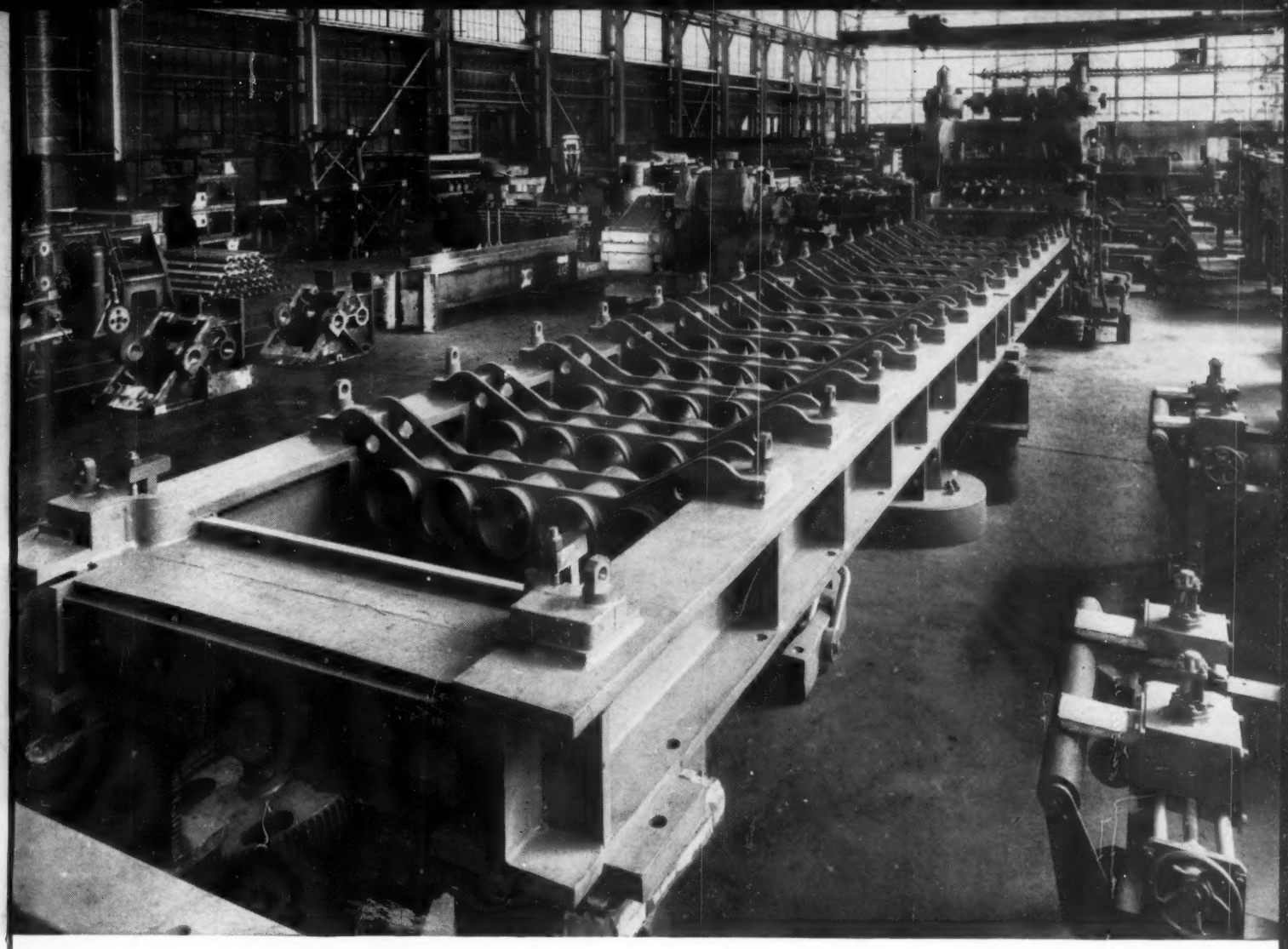

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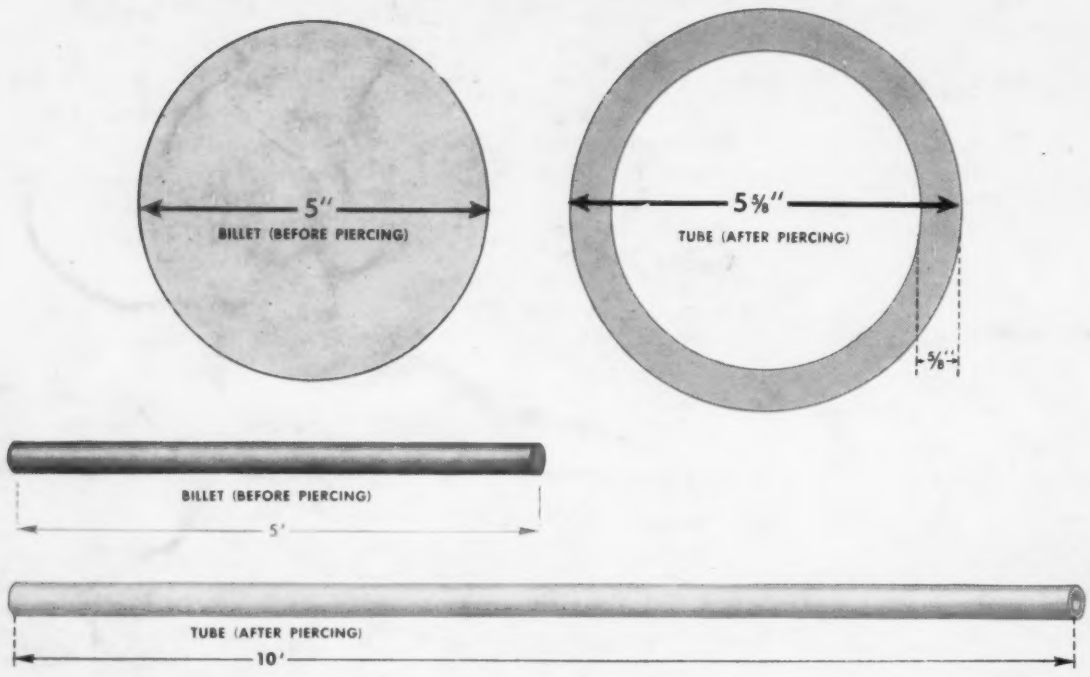

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